AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Volume 85
Number Three
$1.00 a Year.

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

JANUARY 1921

Published monthly by
W. B. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

RAIN, MIST,

Ice and Snow will not rust an Anchor Post Chain Link Factory Fence.

For every part is thoroughly galvanized by the hot dip process.

From the tip of each supporting arm to the end of its post, deep in the ground, every part is heavily protected by this impenetrable zinc coating. The posts themselves are steel U-bars, hollow on one side, exposing all surfaces to the weather. This permits the "inside" of each post to dry as quickly as the outside, and prevents rusting from within.

Pictures and descriptions will be sent you gladly. Write or phone our office nearest you.

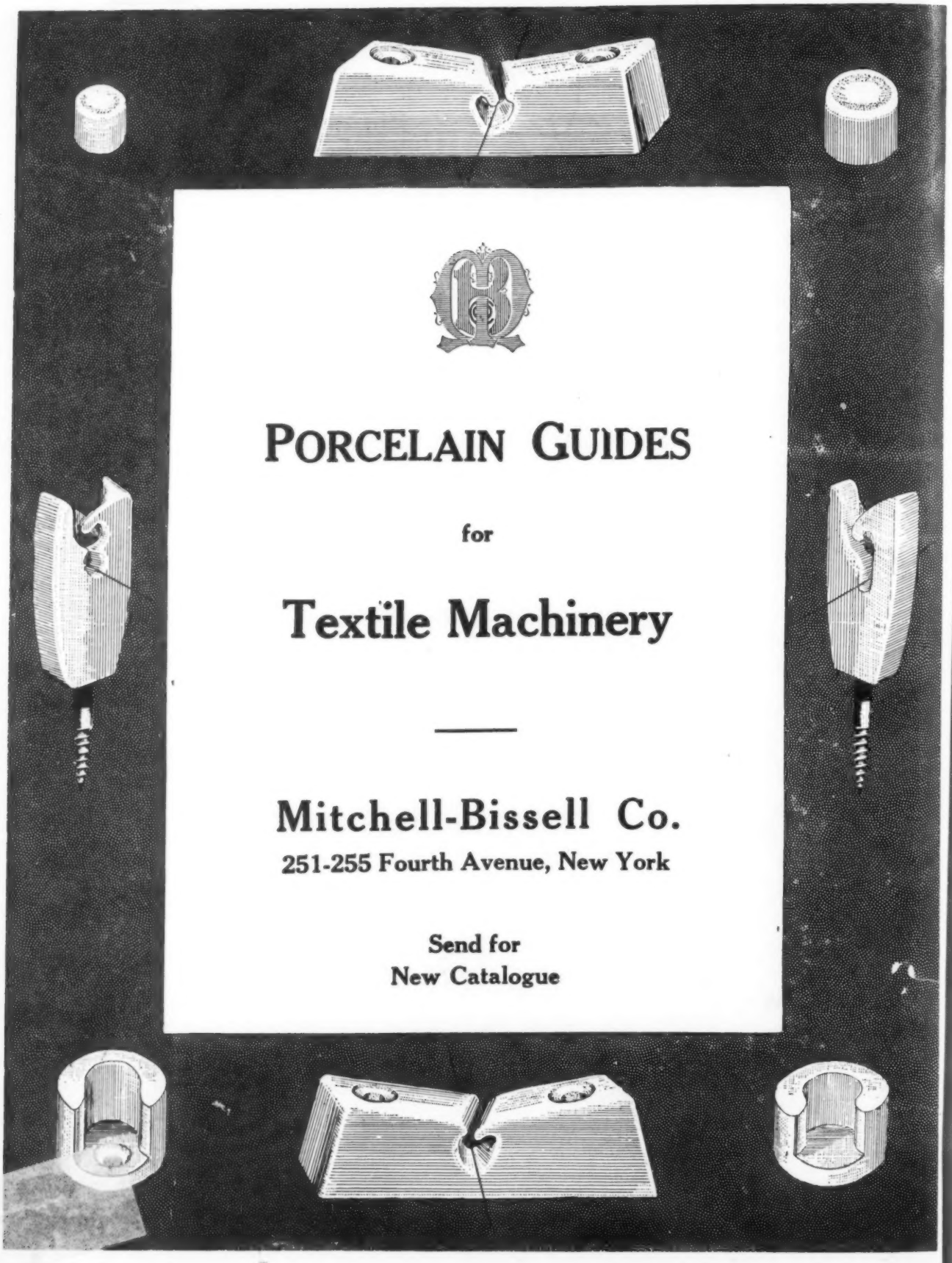
ANCHOR POST IRON WORKS

167 Broadway York, N. Y.

Boston, 79 Milk St.; Hartford, [illegible] Greenville, S. C.; Philadelphia, [illegible] Trust Bldg.; Cleveland, Guardian Bldg.; Chicago, 8 So. Dearborn Street; Pittsburgh, Pa., Jenkins Arcade. 2311-G

Anchor Post Fences

Table of Contents, page 77. Advertisers' Index, page 396. Buyers' Index, page 384.


PORCELAIN GUIDES
for
Textile Machinery
Mitchell-Bissell Co.
251-255 Fourth Avenue, New York
Send for
New Catalogue

A Northrop Loom Mill Calls for less Weavers

Less Weavers Need Less Tenements

Northrop Loom Mills Help Solve the Housing Problem

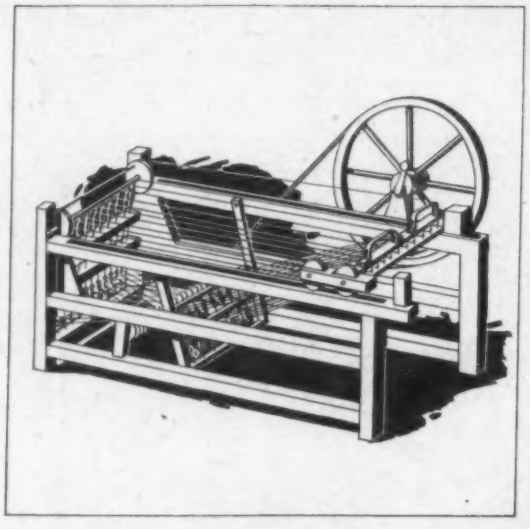
DRAPER CORPORATION

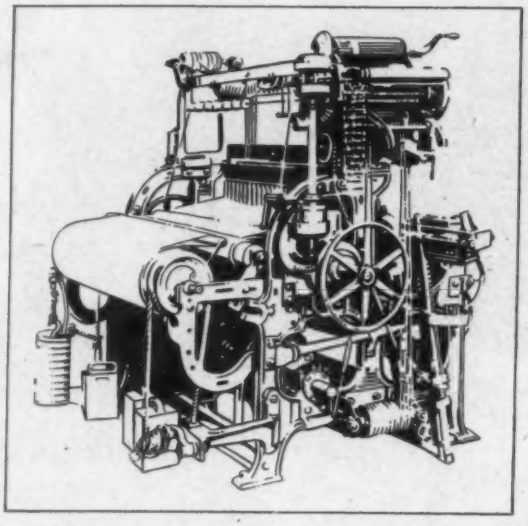
HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

Copyright 1917 by Draper Corporation

From
John Wyatt
18th Century





To
John Hyatt
20th Century

HYATT BEARINGS FOR

TWO CENTURIES OF PROGRESS

IN 1733 John Wyatt invented a machine which eventually revolutionized the manufacture of textiles, for it made threads without the use of human manipulative skill.

Then came improvements by Arkwright, Thorpe, Compton, Kelly, Roberts and many others.

Gradual refinements and the introduction of new ideals in textile machinery design made possible increased production per unit and uniformity of material.

Hand power—steam power—then electricity, each took its important part in the progress of the industry.

IN the 20th Century the application of Hyatt Roller Bearings to textile machinery of all kinds is another real step forward—an improvement that is of vital importance to all progressive textile manufacturers.

Being durable, Hyatt Roller Bearings make textile machinery not only more greatly productive but absolutely dependable. They effectively reduce power, maintenance, and lubricant costs.

Specify that your textile machinery be Hyatt equipped and know the advantages of truly modern equipment.

1979

HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

TEXTILE MACHINERY

What We Are Doing for Others We Can Do for You

The quality and quantity of the production of any mill depends mainly upon the way the workers think. If they think *right* and have confidence in your fairness, they are loyal and productive. If they are dissatisfied, in the least or have any concealed jealousy, they are non-productive.

All our experience—all our knowledge of the psychological effect of certain methods that have proved correct in solving labor difficulties, can be swung directly into your mill. What we are doing for others, we can do for you. Read the following letter, which is only one of hundreds which we have on file at our Executive Offices:

"Gentlemen:

"Having availed ourselves of your service for considerable length of time, we feel justified in writing you this letter of appreciation.

"As a direct result of your efforts, our labor problems have been simplified. You have eliminated the unrest and enabled us to greatly increase the quality and quantity of our output. The suggestions we have received from your service have proved practical and valuable, and the educational campaigns have been properly cared for through the efforts of your organization.

"As a whole the service has exerted a healthy and constructive influence in our plant, and we will continue to avail ourselves of the service indefinitely. We consider the service an investment, and desire, through co-operation, to get the full benefits of it.

Yours very truly."

(Name withheld for obvious reasons.)

SHERMAN SERVICE INC.

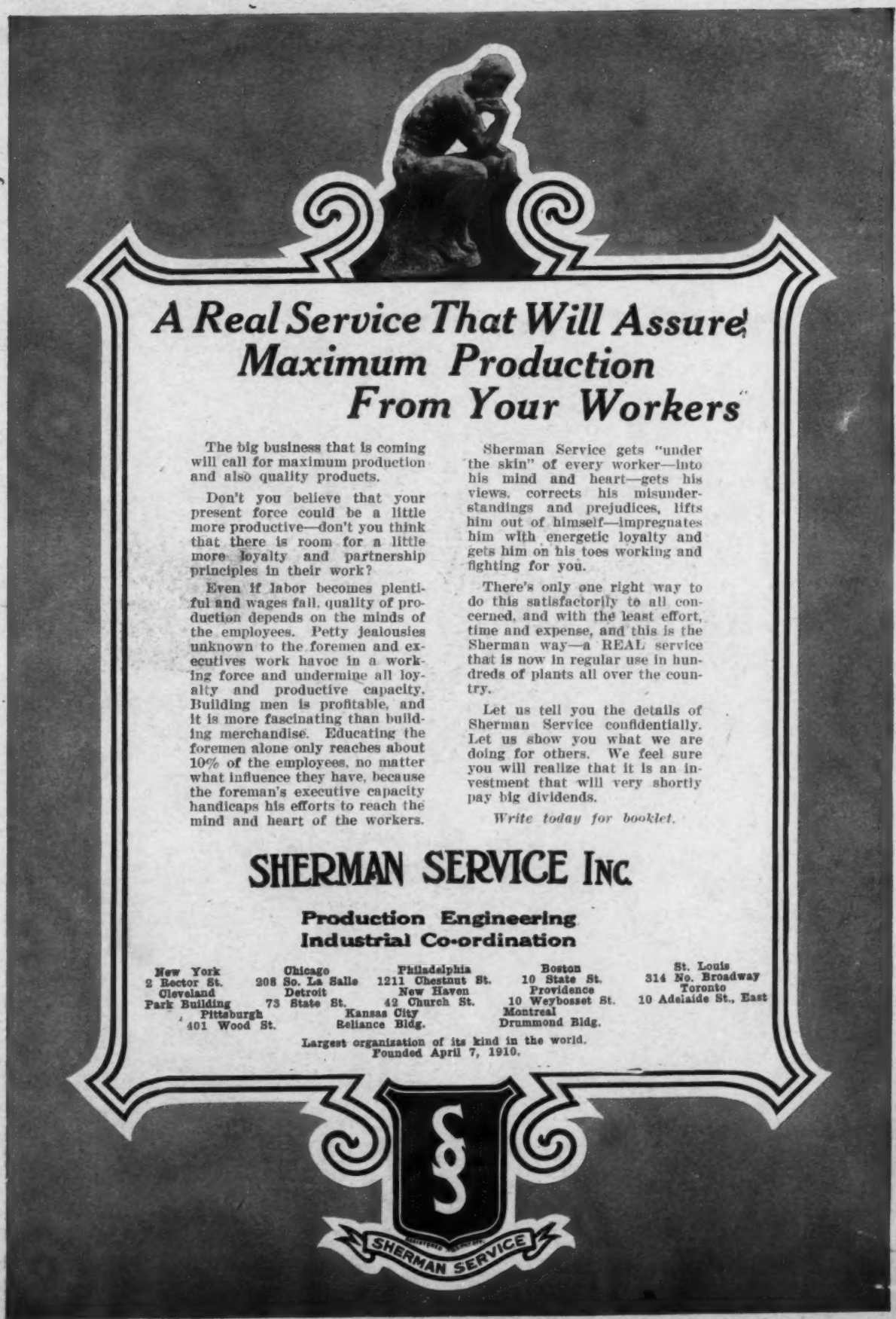
Production Engineering
Industrial Co-ordination

New York 2 Rector St.	Chicago 208 So. La Salle	Philadelphia 1211 Chestnut St.	Boston 10 State St.	St. Louis 314 No. Broadway
Cleveland Park Building	Detroit 73 State St.	New Haven 42 Church St.	Providence 10 Weybosset St.	Toronto 10 Adelaide St., East
Pittsburgh 401 Wood St.		Kansas City Reliance Bldg.		Montreal Drummond Bldg.

Largest organization of its kind in the world.

Founded April 7, 1910.

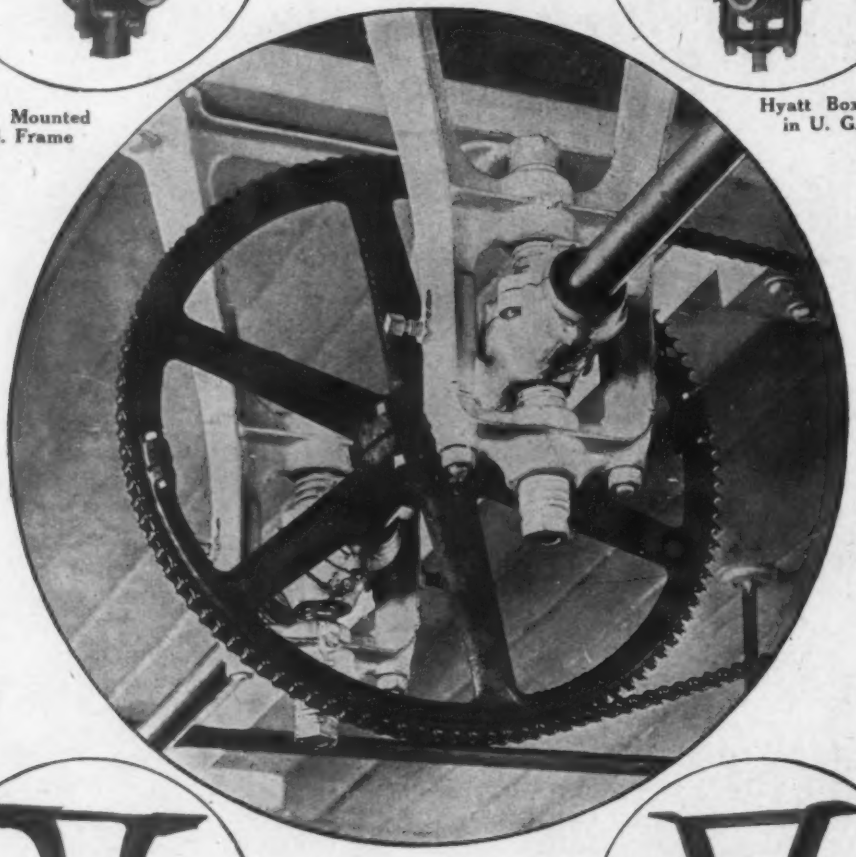
SHERMAN SERVICE


A Real Service That Will Assure
Maximum Production
From Your Workers
The big business that is coming will call for maximum production and also quality products.
Don't you believe that your present force could be a little more productive—don't you think that there is room for a little more loyalty and partnership principles in their work?
Even if labor becomes plentiful and wages fall, quality of production depends on the minds of the employees. Petty jealousies unknown to the foremen and executives work havoc in a working force and undermine all loyalty and productive capacity. Building men is profitable, and it is more fascinating than building merchandise. Educating the foremen alone only reaches about 10% of the employees, no matter what influence they have, because the foreman's executive capacity handicaps his efforts to reach the mind and heart of the workers.
Sherman Service gets "under the skin" of every worker—into his mind and heart—gets his views, corrects his misunderstandings and prejudices, lifts him out of himself—impregnates him with energetic loyalty and gets him on his toes working and fighting for you.
There's only one right way to do this satisfactorily to all concerned, and with the least effort, time and expense, and this is the Sherman way—a REAL service that is now in regular use in hundreds of plants all over the country.
Let us tell you the details of Sherman Service confidentially. Let us show you what we are doing for others. We feel sure you will realize that it is an investment that will very shortly pay big dividends.
Write today for booklet.
SHERMAN SERVICE INC.
Production Engineering
Industrial Co-ordination
New York 2 Rector St.
Chicago 208 So. La Salle
Philadelphia 1211 Chestnut St.
Boston 10 State St.
St. Louis 314 No. Broadway
Cleveland Park Building
Detroit 73 State St.
New Haven 42 Church St.
Providence 10 Weybosset St.
Toronto 10 Adelaide St., East
Pittsburgh 401 Wood St.
Kansas City Reliance Bldg.
Montreal Drummond Bldg.
Largest organization of its kind in the world.
Founded April 7, 1910.
SHERMAN SERVICE

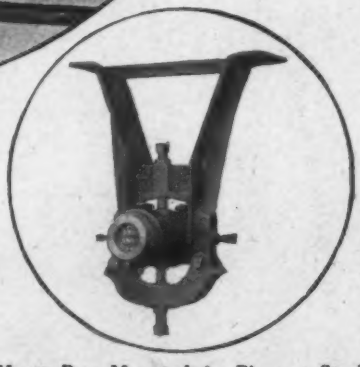
WHY ARE GOOD PRODUCTION MANAGERS

Hyatt Box Mounted in B. & S. Frame

Hyatt Box Mounted in U. G. Frame



Hyatt Box Mounted in 4 pt. Set Screw Frame.



Hyatt Box Mounted in Pioneer Steel Frame.

HYATT BEARINGS

LIKE HYATT ROLLER BEARING HANGERS?
THEY INCREASE PRODUCTION

Instead of absorbing power in rubbing friction, as plain bearings do, Hyatt Roller Bearing Hangers *transmit* power to the machines where it can do useful work.

Shafting supported by Hyatt Roller Bearing Hangers turns so easily that at least 15 per cent more power is sent to the machines, increasing production at least 15 per cent.

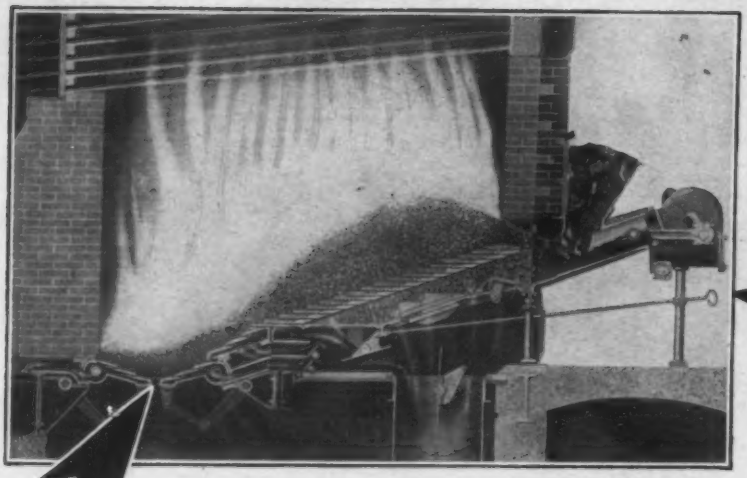
With power costs steadily increasing it will pay you to install Hyatt Roller Bearing Hangers and turn more of your power into salable products.

Hyatt Roller Bearing Co., New York, N. Y.

B-100

FOR LINE SHAFTS

100%



"If you consider your coal at its cash value, the unburned coal in the ash is like small change."

—Industrial Power
Sept. 1920

The "small change" of the Boiler Room, is the unburned fuel that passes over the dump grate.

100% Air Distribution prevents the loss of this "small change."

100% Air Distribution means that the Westinghouse Underfeed Stoker is a stoker through and through—that every square foot of grate surface is active grate surface from front wall to bridge wall.

100% Air Distribution means that the DUMP GRATE is not a dump grate ONLY—it is ACTIVE GRATE SURFACE to be used when needed. It is supplied with air so that every particle of unburned fuel reaching it may be efficiently consumed.

No "small change" passes over the dump grate of the Westinghouse Underfeed Stoker.

Ask for Leaflet 3985 describing the Westinghouse System of Air Distribution

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Large American Cities.

50634

W
WESTINGHOUSE ELECTRIC

Westinghouse

UNDERFEED OVERFEED AND CHAIN GRATE STOKERS

The Mason Cotton Fabric Co.

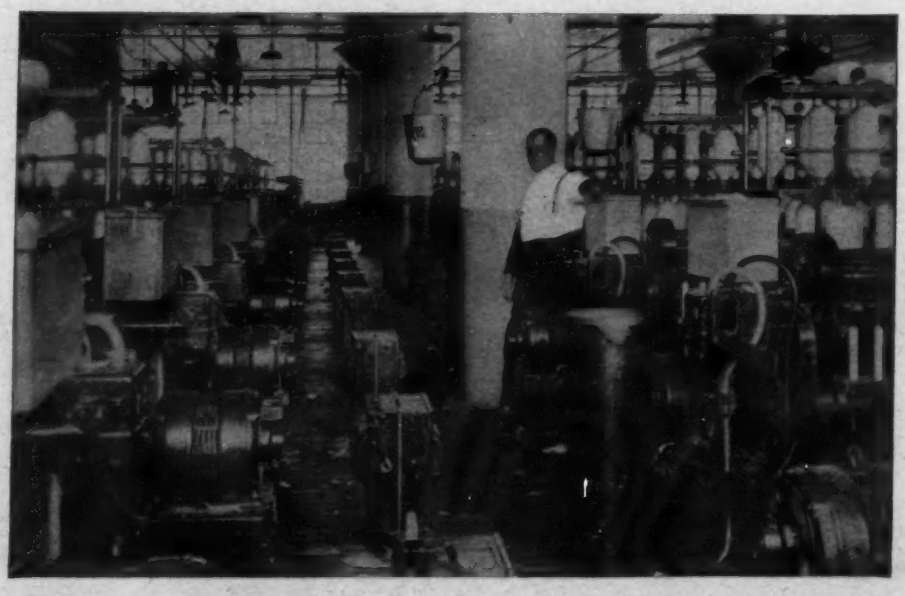
Manufacturers of all Fabrics
For Mason Tires

According to the best practice of today, the Mason Cotton Fabric Company has installed Westinghouse Individual Motor Drive on the spinning frames of its new mill at Kent, Ohio.

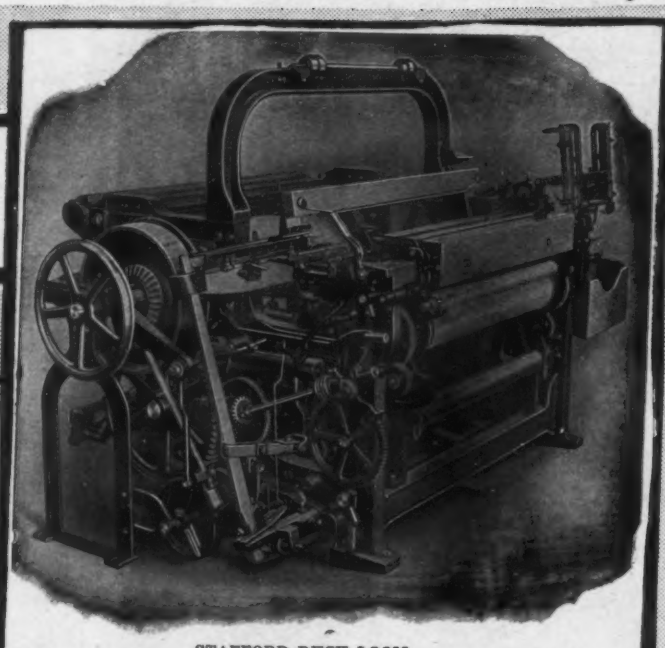
Thus this company is assured of from 5% to 7% greater production than can be produced with other methods of drive.

—Increased Production
—Better Plant Layout
—Freedom from Overhead Construction
—Better Lighting
—Cleanliness
—Congenial Working Surroundings

Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities.



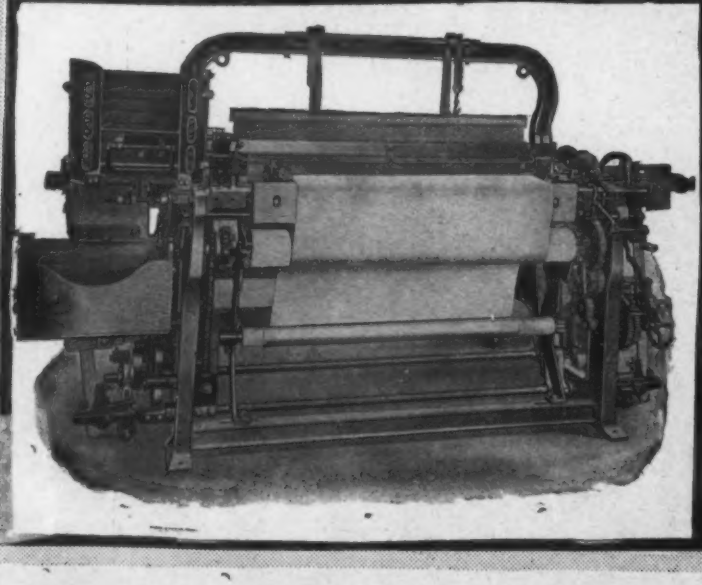
Dependable Looms



STAFFORD DUCK LOOM

The Stafford Company has for a great many years concentrated on the production of a strictly practical loom. Convincing proof of the soundness of this idea is found in the large list of repeat orders for Stafford looms from a steadily growing list of progressive mills both in this country and Canada.

THE STAFFORD COMPANY

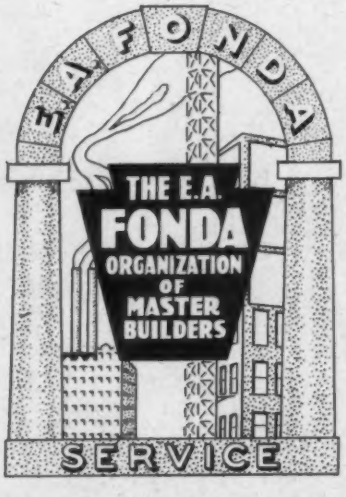


Readville
Mass.

Southern Agent
J. H. MAYES
Charlotte
N.C.

FONDA SERVICE

FONDA Service in building construction **means** something. It's not mere "sales talk" but a real service that everyone of our clients will enthusiastically testify to be a solid foundation for building satisfaction and economy.



FONDA Service means that your plans are not mere paper to go by, but they are interpreted at every point with a view toward giving you a better building at less cost. We are proud of our ability in looking after your interests—perfecting your plans or advising with your architects. And we are doubly proud of our knowledge through past experience which enables us to incorporate ideas into our constructions that prove valuable to our clients. Any building construction, large or small, placed in our hands is carried through without delays or hold-ups of any kind, due to FONDA foresight and working organization.

We feel that we can serve Southern clients better than anyone else, because we are on the grounds with equipment that is the most up-to-date and complete known to the building trade—with a force of experts who work solidly together for the interests of our clients and also to uphold our past reputation for building satisfaction, economy and speed.

Let us estimate on your next building or addition. Let us advise with you or your architects. Full details of FONDA Service sent on request. It should be in your files for future reference. Tell your stenographer to write us today.

THE E.A. FONDA ORGANIZATION OF MASTER BUILDERS

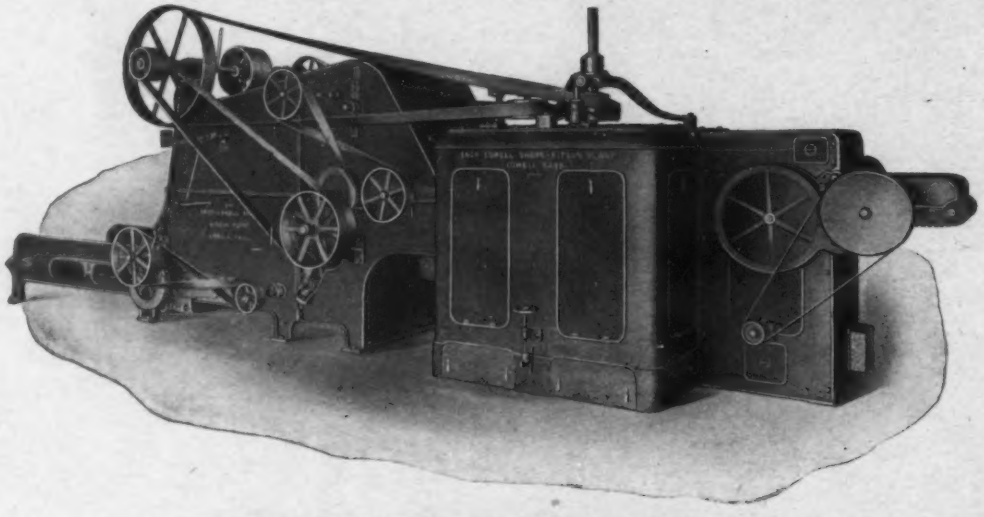
120½ W. WASHINGTON GREENVILLE S.C.

KINNEY BLDG. CHARLOTTE N.C.

SACO-LOWELL SHOPS
Cotton Machinery

INCLUDING

OPENING, CONVEYING AND DISTRIBUTING EQUIPMENT



VERTICAL OPENER COMBINATION

PICKING ROVING WARPING
CARDING SPINNING SLASHING
DRAWING SPOOLING TWISTING

Waste Reclaiming Machinery

SHOPS AT

LOWELL, MASS. BIDDEFORD, ME.
NEWTON UPPER FALLS, MASS.

EXECUTIVE OFFICES
BOSTON, MASS.

ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.
Southern Branch Office, GREENVILLE, S. C.

LUNKENHEIMER PRODUCTS

Globe Valves
Angle Valves
Cross Valves
Safety Non-return Stop Valves
Balanced Throttle Valves
Gate Valves
Check Valves
Blow-off Valves
Pop Safety and Relief Valves
Water Columns, Water Gauges and Gauge Cocks
Whistles and Whistle Valves
Ground Key Cocks
Injectors and Ejectors
Lubricators, Oil and Grease Cups.
Oiling Devices
Automotive Accessories, Etc.

With more than fifty-eight years of success in service have established their reputation for quality. And "Lunkenheimer Quality" means reliability, continuity of service and economy in maintenance.

The Lunkenheimer system of test and inspection gives a perfect knowledge of the condition and actual performance of the article before it leaves the factory; proves its serviceability, and assures the user of safe and efficient operation.

Write "Lunkenheimer Equipped" in your Engine and Boiler Specifications. It is a guarantee for Safety, Efficiency, Performance and Satisfaction.

Lunkenheimer Products are obtainable from supply houses everywhere. Insist on having the genuine.

THE LUNKENHEIMER CO.
"QUALITY."
Largest Manufacturers of High Grade Engineering Specialties in the World
CINCINNATI
New York Chicago
Boston London

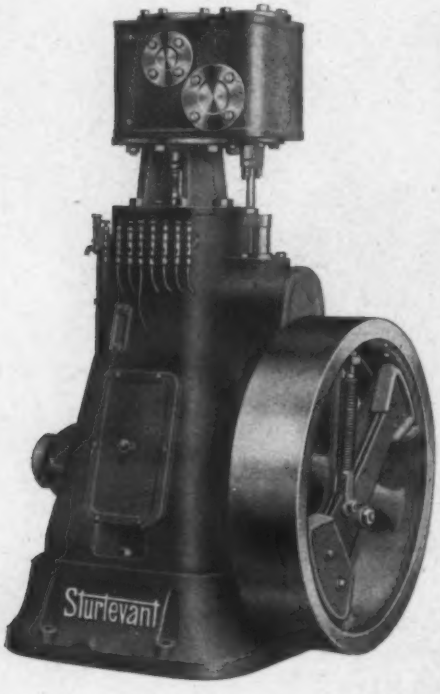
Export Department:
129-135 Lafayette St.,
New York, N. Y.

32-24-10

BLANKETS T

Sturtevant Apparatus - Sturtevant Eng

(REG. U. S. PAT. OFF.)



VS-7 Steam Engine shwing sight oil feeders of gravity oiling system

Steam Engines

Designed to U. S. Navy specifications, the most exacting in the world. Unexcelled in reliability. Give stellar service under all conditions. Good steam economy and close speed regulations. Built either with gravity or with forced feed lubrication, as conditions require. Used for direct connection to blowers, fans, generators and for independent power service, automatic or throttling. Every engineer will be interested in the many distinct features of their design. Write for catalogue No. 239.

Steam Turbines

Particularly adapted to driving Sturtevant Fans and Blowers, pumps, generators and other auxiliaries with the minimum in steam consumption, attention and repairs. Built with solid rotors with individually controlled nozzles having internal reverse buckets to insure the most efficient absorption of the steam velocity. Unsurpassed in close speed regulation and in protection against over-speed. Ask for our new catalogue No. 256.

Type 6 Sturtevant Steam Turbine (unretouched photograph)

Generating Sets

Whether steam turbine, steam engine or gasoline engine driven, Sturtevant electric generating sets comprise every qualification to render the maximum of efficient service. Unsurpassed in operating economy by any units in their class. Write for bulletins.

Wherever You

Sturt

REG. U. S.

the high quality of the product is assured. It symbolizes the best engineering practice in design and construction of Fans, Blowers, Turbines, Engines, Economizers and other power apparatus that has been the outcome of over 60 years' experience.

To assist prospective purchasers 22 Sturtevant Engineering service stations are

LIST OF

Blowers and Exhausters
134-Steel Pressure Blowers
242-Monogram Blowers and Exhausters
228-Multivane Fans. Design 3
238-Multivane Fans: Design 3
Performance Charts
237-Ready-to-run Ventilating Sets
257-Positive Pressure Blowers.
Forced Draft Apparatus
236-Forced Draft Fans
224-Turbo Undergrate blower Design 3
Fuel Economizers
150-Sturtevant Fuel Economizers
Engines
239-Vertical Single Cylinder VS 7 and VS 8
Generating Sets
239-With VS 7 and VS 8 Engines
255-Gasoline Elec., Gen. Sets

B. F. STURTEVA

Hyde Park, Boston, Mass.

HE COUNTRY

ineering Service - Sturtevant Systems

(REG. U. S. PAT. OFF.)

See the Name

evant

PAT. OFF.

maintained in the leading business centers of the country. A staff of Sturtevant engineers is ready to serve you promptly. Their advice is worth money—and costs you nothing.

Better get acquainted with the Sturtevant line. Send for any of the catalogues listed below.

BULLETINS

Heating and Ventilating
230-Heaters
227-Heating and Ventilating Layouts, Blue-Print Book
1011-Heating and Ventilating Factories
1013-Heating and Ventilating Public Buildings
1014-Heating and Ventilating Govt. Bldgs.
1015-Heating and Ventilating Book Complete
215-Heating and Ventilating Treatise

Forges 1050-Forges

Motors and Generators
217-D-G. Type D. Commutating Poles

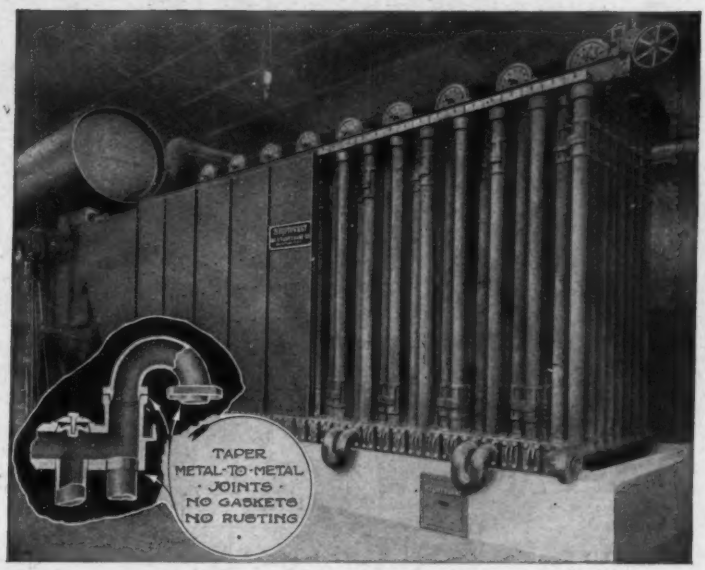
Vacuum Cleaners
224-Stationary Vacuum Cleaners
1024-Portable Vacuum Cleaners

Steam Turbines
256-Steam Turbines

Miscellaneous
195-General Catalogue
213-Power Apparatus
225-Air Washers Type S
No. 25-Canadian Edition

NT Company

Branches in All Principal Cities



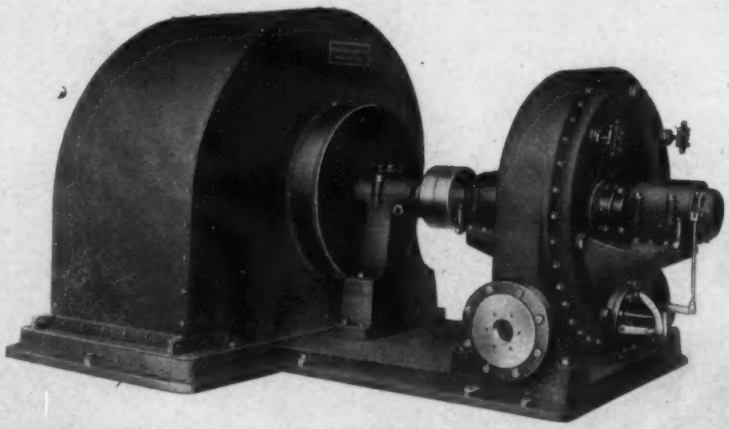
Sturtevant Economizer installation. The metal-to-metal joints eliminate all use of gaskets, packing and rusting; staggard pipe construction insures high feedwater temperature

Fuel Economizers

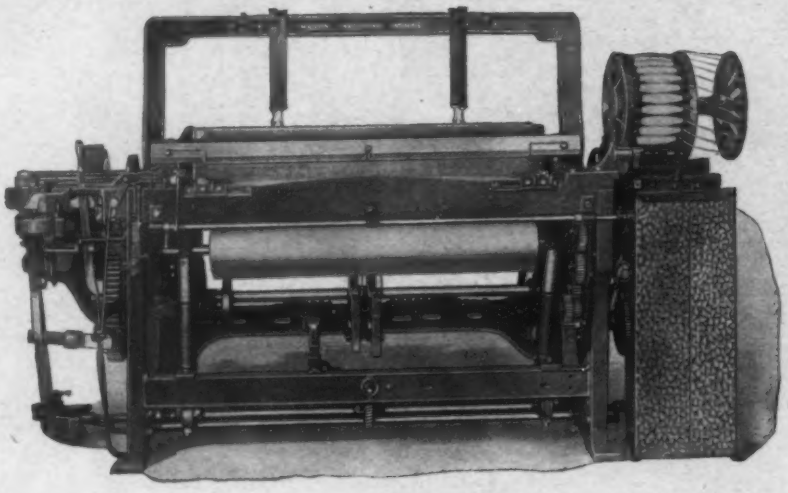
At a lower operating and repair cost the highest feed water temperature is assured. Large fuel savings effected. Boiler life prolonged—capacity increased. Smoke nuisance relieved. Two supreme Sturtevant features are the staggard pipe construction and the tapered metal-to-metal joints (see the illustration) which eliminates use of all gaskets, packing and rusting. Withstand 300 lb. pressure. Request catalogue No. 150.

Mechanical Draft

The supremacy of Sturtevant induced and forced mechanical draft apparatus-engine, turbine or belt driven—embrace the refinement and perfection derived from 60 years of "knowing how" in the construction, as world leaders, of fans, fan systems and related products.



Turbo-Driven Forced Draft Fan



Mason Automatic Loom

With Battery, Warp Stop Motion, Feeler and Shuttle Lock

RANDOLPH CROMPTON'S PATENTS

Fewer Parts Standard Construction Rebounding Shuttles Overcome

Damage to Shuttles and Bobbins Prevented

WE ALSO BUILD
REVOLVING FLAT CARDS.
DRAWING FRAMES.
RING SPINNING FRAMES.
DUCK LOOMS in various widths and weights.
SILK LOOMS—Single Box and Two Box.
WIDE SHEETING LOOMS.

Mason Machine Works

Taunton, Mass.

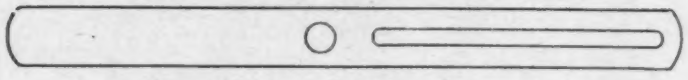
E. HOWARD, Southern Agent

GREENVILLE, S. C.

Immediate Delivery!

Greist

Loom Drop Wires



Made of special Heddle Wire.

"Satin Finish" an exclusive process.

Used and endorsed by leading textile mills throughout the country.

Samples upon request

The manufacturing facilities of the Greist Manufacturing Company, since 1871 the largest manufacturers in the world of sewing machine attachments, are a dependable source of supply to rely upon for drop wires.

The Greist Mfg. Co., Dept. C, New Haven, Conn.

New England Representative:
Boyd's Textile Bureau,
F. W. Boyd, Manager,
339 Butler Exchange, Providence, R. I.

Fall River and New Bedford:
Coldwell Gilard Company,
108 Hartwell Street,
Fall River, Mass.

Southern Representative:
G. G. Slaughter Machinery Company,
Greenville, S. C.

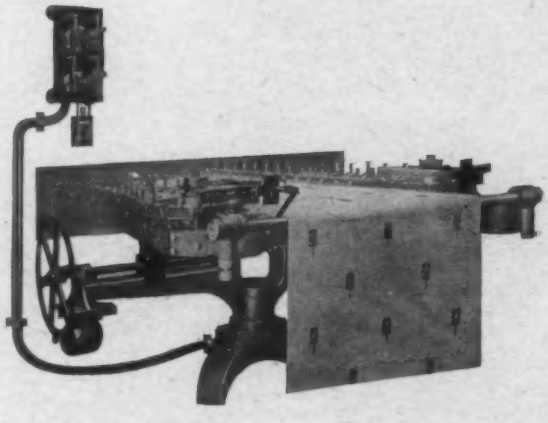
The Schwartz Automatic Electric Guider

For

Straight and Swing Tenter Frames

Handles cloth of any kind, weight or width

A Labor-Saving Attachment of Proven Efficiency



Specified in the largest mills in the country

Manufactured and Distributed by

Blake Electric Mfg. Company

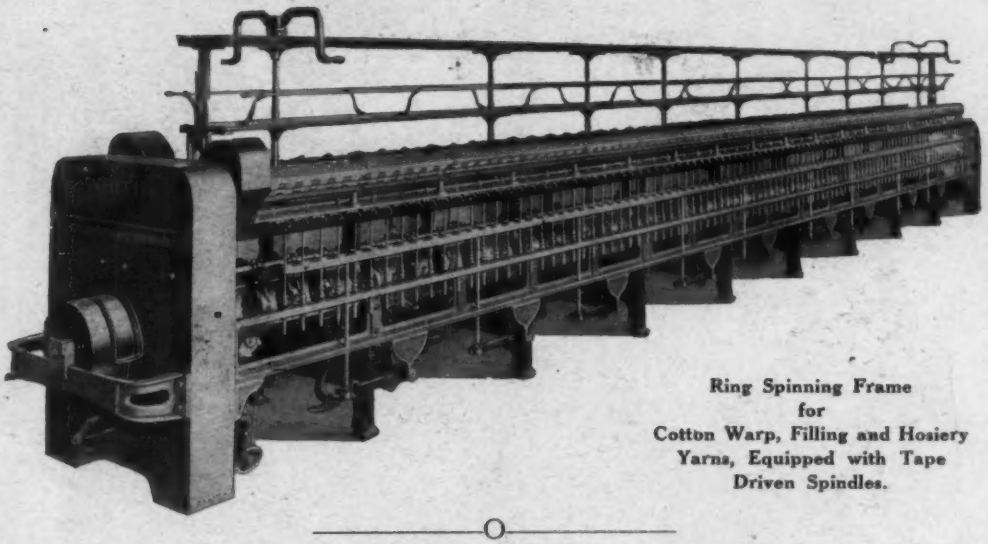
1 Rowes Wharf, Boston, Mass.

For information write Dept. G.

WHITIN MACHINE WORKS

ESTABLISHED 1831.

TEXTILE MACHINERY



Ring Spinning Frame
for
Cotton Warp, Filling and Hosiery
Yarns, Equipped with Tape
Driven Spindles.

Manufacturers of the Following
Machines

COTTON MACHINERY

Opening
Conveying
Distributing
Picking
Revolving Flat Cards
Sliver Lap Machines
Ribbon Lap Machines
Drawing Frames
Roving Frames
Spinning Frames
Spoolers
Twisters
Reels
Quillers
Combing machines of Whitin or Nasmith Type

COTTON WASTE MACHINERY
COTTON AND WOOLEN SYSTEMS

Openers
Pickers
Willows
Card Feeds
Full Roller Cards
Condensers
Revolving Flat Cards
Derby Doublers
Roving Frames
Spinning Frames
Spoolers
Twisters
Special Spinning Frames

WOOLEN MACHINERY

Card Feeds
Full Roller Cards
Condensers
Wool Spinning Frames

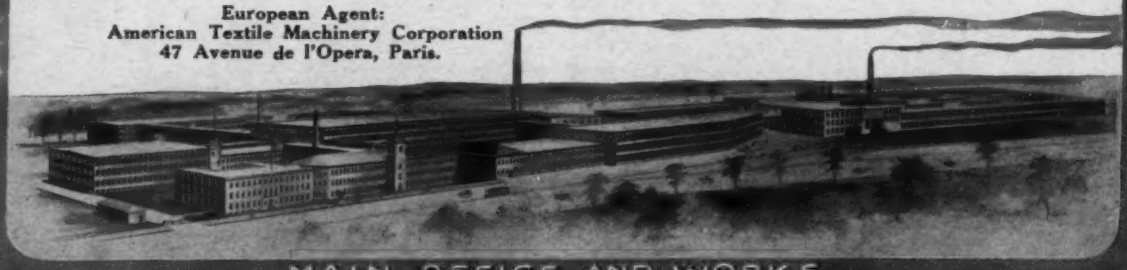
WORSTED MACHINERY

Cone Roving Frames

Also makers of ROLLS, RINGS, SPINDLES, FLYERS and HANK CLOCKS
for all makes of SPINNING, TWISTING and ROVING FRAMES

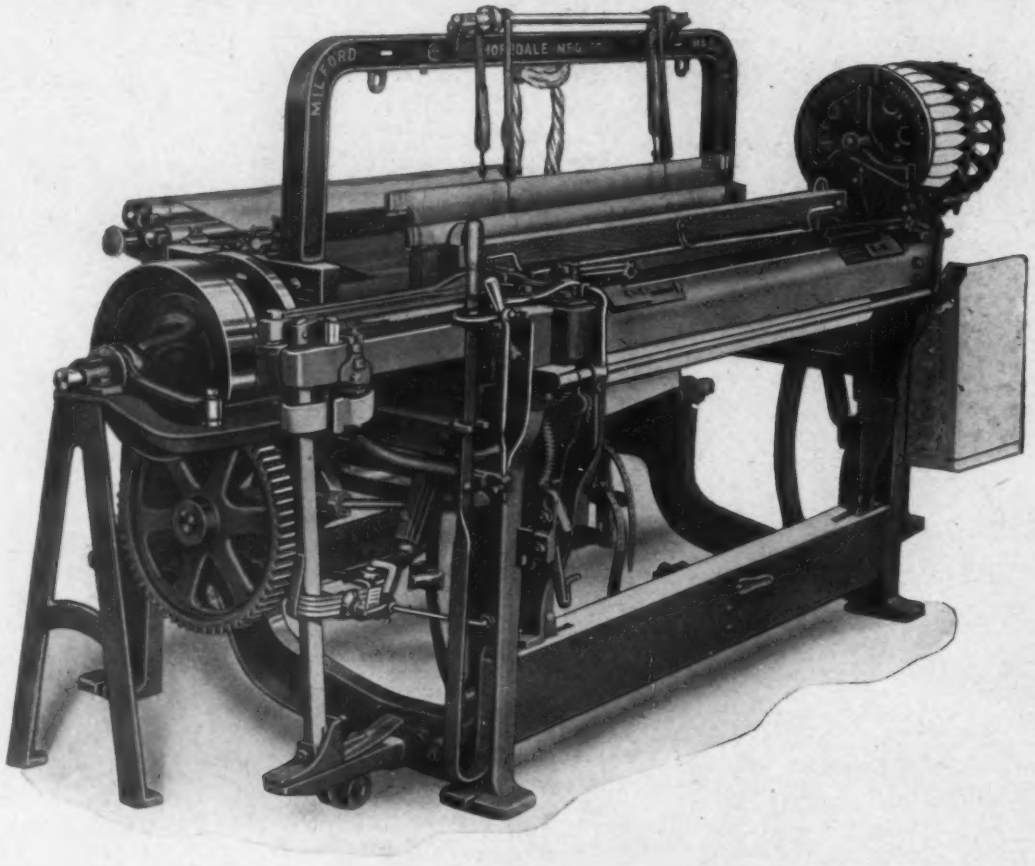
DESCRIPTIVE CATALOGUES SENT ON APPLICATION

European Agent:
American Textile Machinery Corporation
47 Avenue de l'Opera, Paris.



MAIN OFFICE AND WORKS
WHITINSVILLE, MASS., U.S.A.
SOUTHERN OFFICE, CHARLOTTE, N.C.

NORDRAY AUTOMATIC LOOM



For the past few years

A mill could make money on any old loom.

In the Years to Come

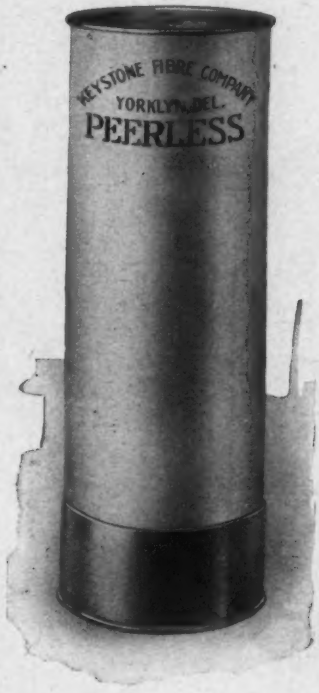
A mill will need the best and latest equipment.

We have an automatic loom of the very latest model; of unquestioned simplicity and thoroughly tested by use.

Ask the men who have seen it.

HOPEDALE MFG. CO.

MILFORD, MASS.



Their specially reinforced kick-proof bottom is one of many reasons why

KEYSTONE "PEERLESS" SEAMLESS ROVING CANS

outwear all others and stand any amount of punishment without losing their unequaled smoothness or appearance.

"Peerless" cans are the lightest and most easily handled.

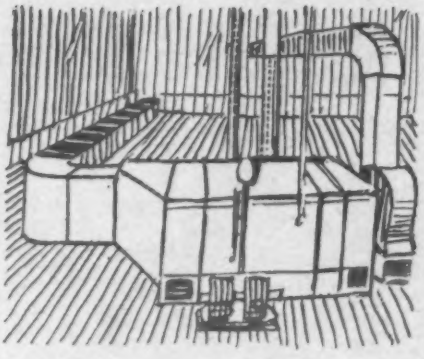
Send for our booklet showing full line of strong, light Keystone Holloware for mills.

Orders filled through any responsible mill supply house, or direct.

Keystone Fibre Company

Box 241 Yorklyn, Delaware

Southern Representatives: Wilson Company, Greenville, S. C.
Philadelphia Office: 504 North American Street
Boston Office: 136 Federal Street



The Place of HUMIDITY IN COTTON MANUFACTURING

No. 7. Yarn Manufacture

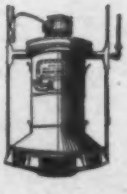
In yarn manufacture, it is recommended that in the finishing operation, where the yarn is prepared for shipment, the winding and packing department be carried at about 8 1-2 per cent R which represents relative humidity of about 62 per cent. With appreciably greater moisture than this, there is a possibility of the stock drying out in shipment.

The Parks-Cramer humidity regulators work on the regain principle. All our approaches to the manufacturer's problem—in so far as humidity is made an accessory—are made on the same basis.

With this as a basis, and the number of pounds of cotton to be manufactured taken into the equation, results are secured that are scientifically exact.

With no two mills alike, with no conditions duplicated, we submit, that the installation of humidifiers is one in which engineering must dictate sizes, capacities and types.

Profit by "High Duty Climate"



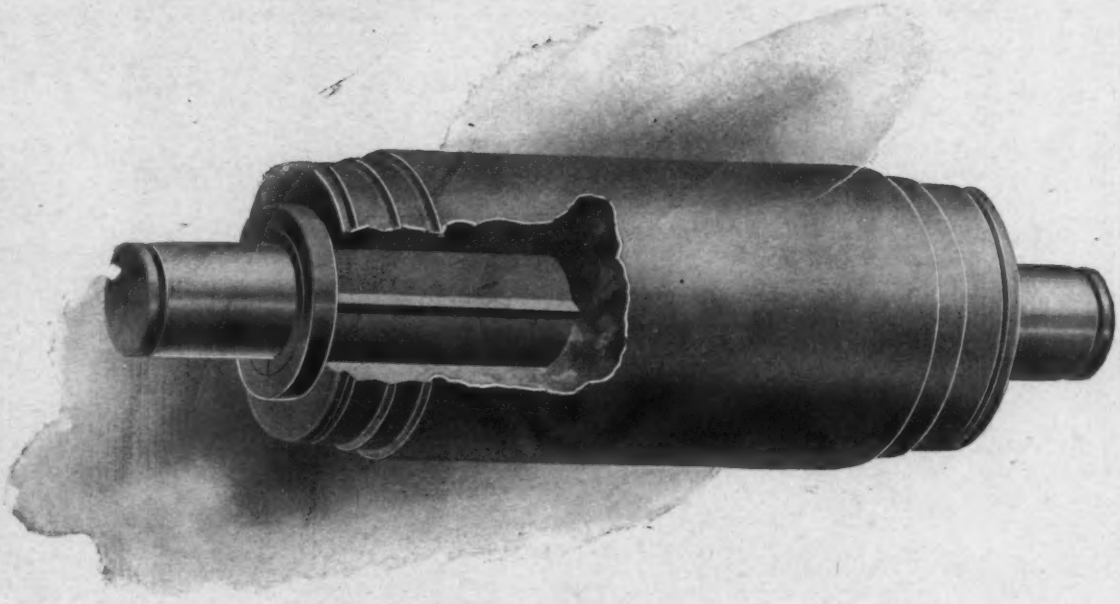
Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

PERKINS

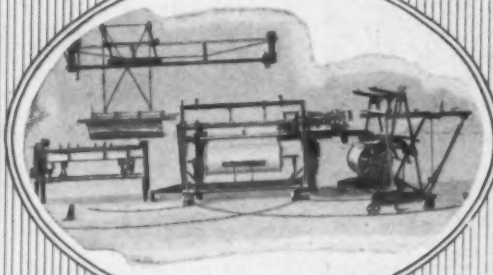


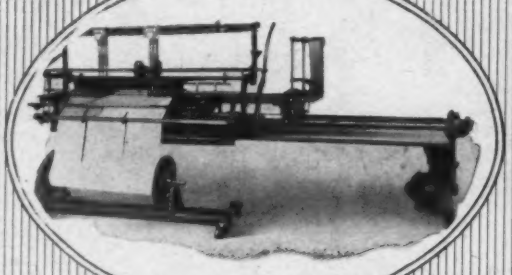
"Resistant but Resilient"

HOLYOKE MASS.

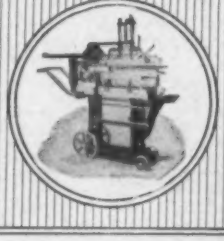
BARBER-COLMAN

WARP TYING & WARP DRAWING MACHINES
HAND KNOTTERS





THE HOME OF BARBER-COLMAN
PRODUCTS VIEWED FROM AN AIRPLANE



BARBER-COLMAN COMPANY
HOME OFFICE & PLANT
ROCKFORD, ILL., U. S. A.

BRANCH
BOSTON, MASS.

BRANCH
GREENVILLE, S.C.

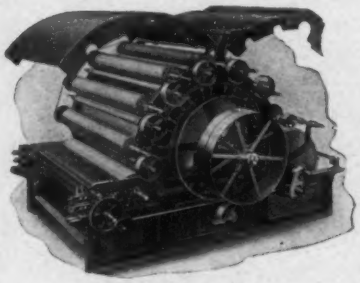
SMITH & FURBUSH MACHINE CO.

PHILADELPHIA

Specialists in machinery for various kinds of WASTES. Builders of Carding and Spinning Machinery for Wool, Asbestos, Cotton-waste and other yarns spun on the wool principle.

Garnetts and Shoddy Machinery. Batt or Felting Machinery, Machinery for wiping and car-box waste.

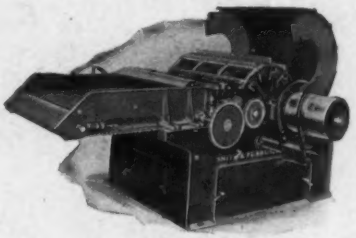
Complete equipments for Rewoven Gunny.



Cotton Waste Card

Ask for Circular S-165

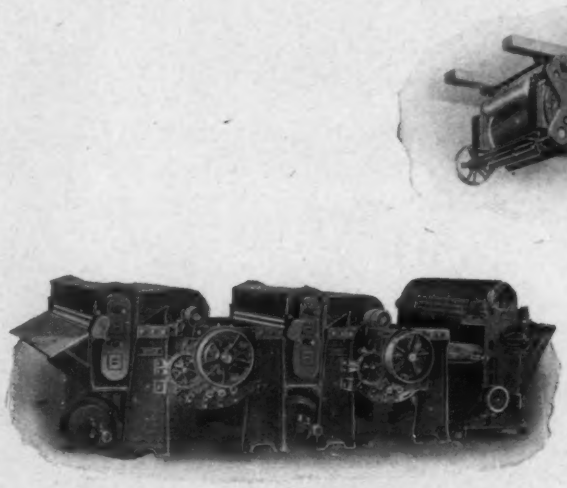
This is one of the carding units in a plant for making mop, cordage or other yarns from cotton waste.



ute Picker

Circular S-166

This machine is used for opening Gunny and Burlap, forming a part of our equipment for the manufacture of Rewoven Gunny Bagging.

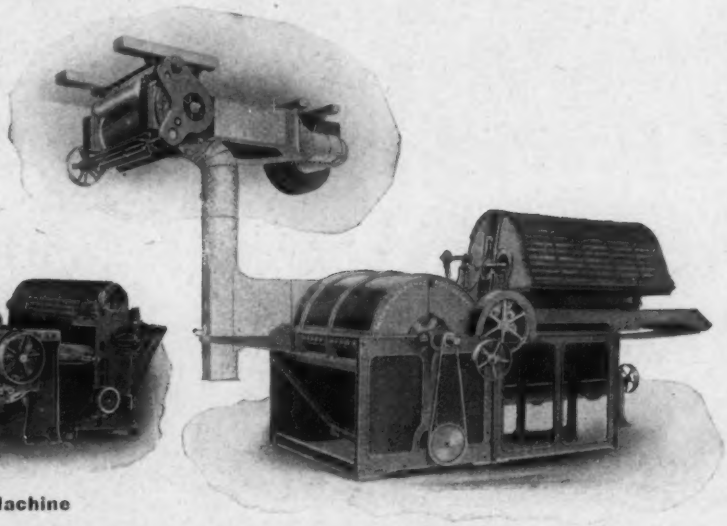


Cotton Waste Reclaiming Machine

(Shaughnessy Patent)

Ask for Circular S-90

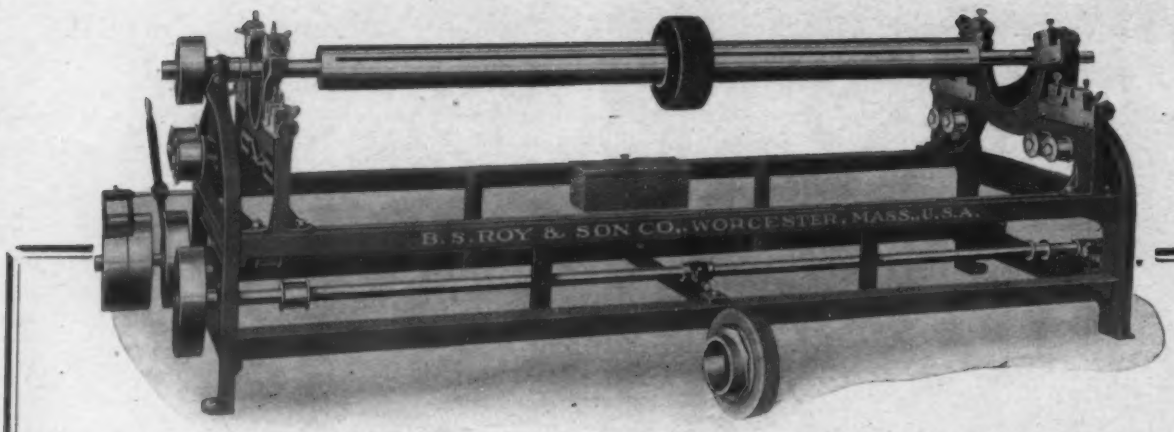
The Shaughnessy Reclaimer does work not done by any other machine in recovering spinning fiber from low grade Cotton Wastes.



Continuous Outfit for Cotton Waste

Ask for Circular S-185

Our continuous Outfit removes the loose dirt, dust and bits of iron, wood, etc., from low grade Cotton Waste.



GETTING BETTER RESULTS FROM MACHINES

In Roy Grinders every practical means has been employed to enable you to do your own grinding easily, quickly and efficiently. Over fifty years devoted exclusively to the manufacturing and improving of Grinding Machinery for Textile Mills have made Roy Grinders "standard" throughout the country.

Textile machines, having parts that become dull in use, require frequent grinding if they are to accomplish the work assigned to them. Only by keeping these machines in tip-top condition, can you secure the production they are capable of giving you.

Roy Grinders will keep these machines producing to capacity and pay handsome returns on your investment. The Roy Line includes Grinders for Cotton and Woolen Cards, Nappers, Garnetts and Calender Rolls.

Tell us your needs and let us suggest the Roy Grinder or Grinders that will meet them.

WRITE TODAY FOR BULLETINS

B. S. ROY & SON CO., Worcester, Mass.

Established 1868

E. M. TERRYBERRY, Southern Agent, 1126 Healy Bldg., Atlanta, Ga.

THE SIMPLEST AND THE MOST ELABORATE

FABRICS

Are produced on

LOOMS

From the

Crompton & Knowles Loom Works

WORCESTER, MASS.

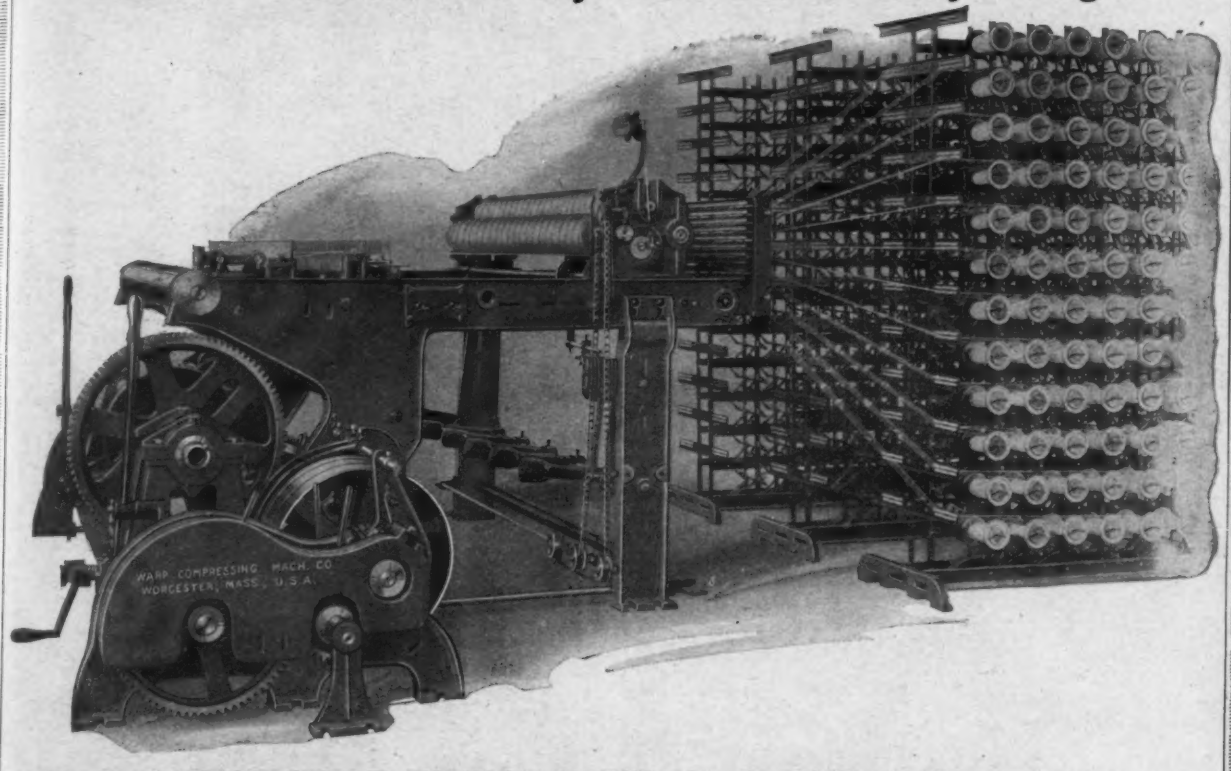
Providence, R. I. Paterson, N. J. Philadelphia, Pa.

Alexander & Garsed, Southern Representative, Charlotte, N. C.

DIRECT BEAMING OUTFITS

FOR PLIED YARNS

Built in Standard Heavy and Extra-Heavy Weights



For:—AUTOMOBILE TIRE FABRICS: Cord and Duck Warps. DUCKS: SAIL-CLOTH: CAMEL'S HAIR PRESS CLOTH: WOVEN BELTING: STITCHED BELTING: CONVEYOR BELTING: ASBESTOS Brake-Band and Clutch Lining, etc.

Beaming directly from your twister spools or cheese packages. UNIFORM TENSIONS

30 to 50 per cent. more yarn per loom beam

ALSO

DIRECT WEAVING OUTFITS FOR CORD FABRIC

COTTON MACHINERY	WOOLEN MACHINERY	WORSTED MACHINERY
Direct Beaming Outfits	Warp Compressors	Warp Compressors
Dry Slasher Outfits	Wool Beamers	Duplex Beamers
Chain Beaming Outfits	Dry Dressing Outfits	Royal Worsted Spoolers
Warper Creels	Compressing Spoolers	Multiple Spoolers

WARPER CREELS for carpet jute
BEAMING HEADS and WARP COMPRESSORS for jute slashers

HIGHEST EFFICIENCY TEST IN YOUR GOODS. Production plus QUALITY.

Representative: F. W. KIESSLING, *Worcester, Mass.*

WARP COMPRESSING MACHINE CO. Worcester, Mass. U. S. A.

Picker Sticks

A Picker Stick may look all right, but what assurance have you that it is made of good stuff? A man may think he has received a fine lot of sticks, but is he sure of it until he has tried them out?

There's a way of knowing that your sticks will be right every time you order—buy them from a concern who has made a study of this work and who guarantees every stick they ship.

We have men who know what a good stick is and we absolutely stand back of our products.

SOUTHERN BENDING COMPANY

Southern Bending Co.

Johnson City, Tenn.

FIG. 20.

All our baskets made from Lane Duck of our own weaving.

Unusually high tensile strength and wearing qualities are obtained by use of strictly long staple cotton and approved modern methods of manufacture.

Standardize

on

LANE CANVAS BASKETS AND TRUCKS

A Style for Every Department

FIG. 27

This Truck embodies all the advantages of Lane Baskets, plus our specially designed non-clogging Thread-guard Casters. Furnished in either stationary or swivel frame style, of generous diameter and tread.

W. T. LANE & BROTHER

Manufacturers

Poughkeepsie :: :: **New York**

MONROE

Calculating Machine

"Worth $5,000"

FOR several years, the Kent Mfg. Co., manufacturers and converters of cotton fabrics, have been putting the burden of their figure-work up to the Monroe Calculating Machine. "If we could not replace the Monroe," they write, "we would positively not do without it for the sum of $5,000.00."

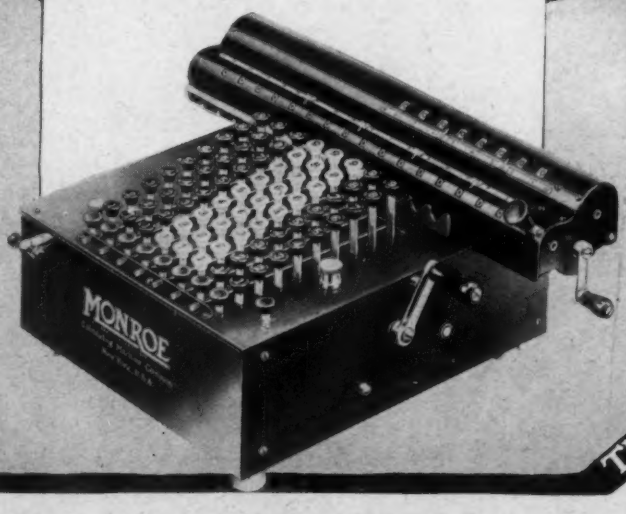
That is the way hundreds of other cotton mills feel toward the Monroe Calculating Machine. These mills like the simplicity of Monroe operation—so simple that even an inexperienced clerk can do intricate figure-work on the Monroe after half an hour's instruction.

These mills like the speed of the Monroe. An instant to depress the keys, a few quick turns of the crank, and there's your answer—in a fraction of the time it takes by any other method.

And they like the Monroe's guarantee of accuracy. When you've finished a calculation, you don't have to guess that your answer is right. You know it is. A glance at the dials of the Monroe proves it to you.

You will like the Monroe when you see it working in your own mill, on your own daily business problems, figuring all your figure-work. Mail the coupon below for "Handling Figures at Spindle Speed" or a demonstration and your request will be referred to the office nearest you of the 100 Monroe Branch Offices in United States and Canada.

Section of office, Kent Mfg. Co., showing the Monroe in operation.



The "SHOW ME" Coupon—Mail it today

Monroe Calculating Machine Co., Woolworth Bldg., New York

Without obligating us, (check items desired)
☐ Send us a copy of "Handling Figures at Spindle Speed."
☐ Arrange for a demonstration in our own office.

Firm Name .....

Your Name .....

Address .....

Cotton 1-21

"FUN-FUL" OCEAN WAVE IN USE IN WASHINGTON PARK.. CHICAGO. NOTE THE CAPACITY OF IT.

Be Sure

YOUR PLAYGROUND SPECIFICATIONS INCLUDE

THE FUN FUL LINE
PLAYGROUND EQUIPMENT
FUN FUL

The Last Word in Improved Playground Equipment

BUY *NOW*, and be assured of prompt delivery. Installation can be made this winter, avoiding early spring rush and attendant delays. We have

"EVERYTHING FOR THE PLAYGROUND"

including Slides, Swings, Giant Strides, Ocean Waves, Gymnasium Combinations, See-Saws, etc., etc.

Write for Catalog.

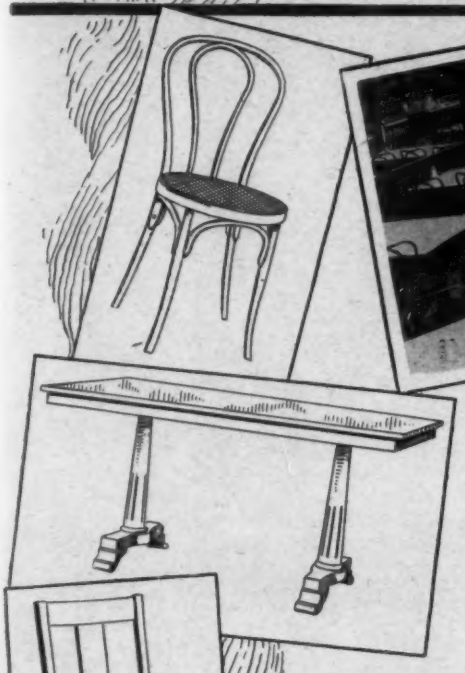
HILL-STANDARD CO.

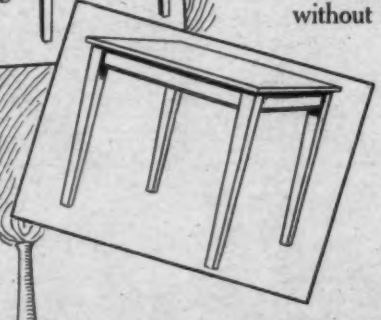
Southern Representative:
MR. EDW. FERGER,
276 Lucile Ave., Atlanta, Ga.

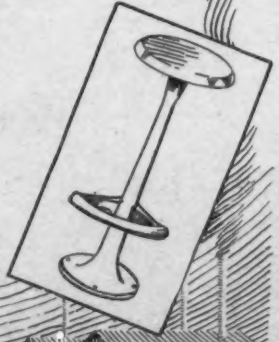
General Sales Offices:
ANDERSON,
INDIANA.

Factories:
ANDERSON, IND.
KOKOMO, IND.

Lunch Rooms for factories







For years we have been selling Lunch Room Furniture to many of America's largest corporations. Such concerns as: Packard Motor Car Co., National Biscuit Co., American Tobacco Co., Kayser Silk Co., American Ever-Ready Works, and many others of equally known fame.

For 50 Years We Have Specialized in the Manufacture of Furniture for Restaurants

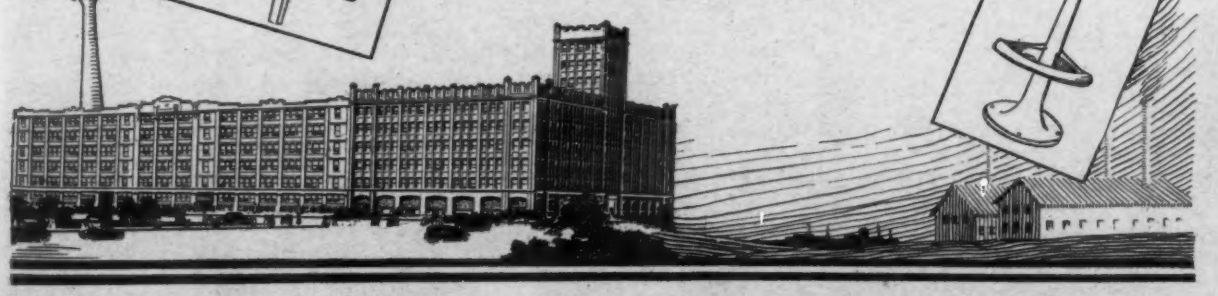
If you have a lunchroom problem our long years of experience will be of assistance to you. In fact, we can help you save money by suggesting just what is actually needed. Many concerns over-buy and that's where they run up the cost of equipping their lunch rooms—unnecessarily. Tell us your desired seating capacity and we will outline the most economical equipment for your factory without sacrificing efficiency of service in any way.

The Reischmann Company

14-16-18 East 32nd Street

NEW YORK CITY

Write for our booklet—our prices will interest you.



F. H. Thomas Company, Boston, Mass.

A First Aid Room or An Emergency Hospital for your Employees will

Decrease your liability for industrial accidents.
Decrease time lost through temporary incapacity of your workers.
Decrease needless suffering from minor injuries and prevent minor injuries from developing into serious cases.
Increase morale and loyalty among your employees and give you opportunity to show your interest in the welfare of your workers.

The F. H. Thomas Company has equipped First Aid Roomsfor over four hundred factories and mills, who have appreciated these facts, including the following Southern Mills: WHITNEY MILLS, WHITNEY, S. C.—WATEREE MILLS, CAMDEN, S. C.—WINDSON MILLS, WINSBORO, S. C.

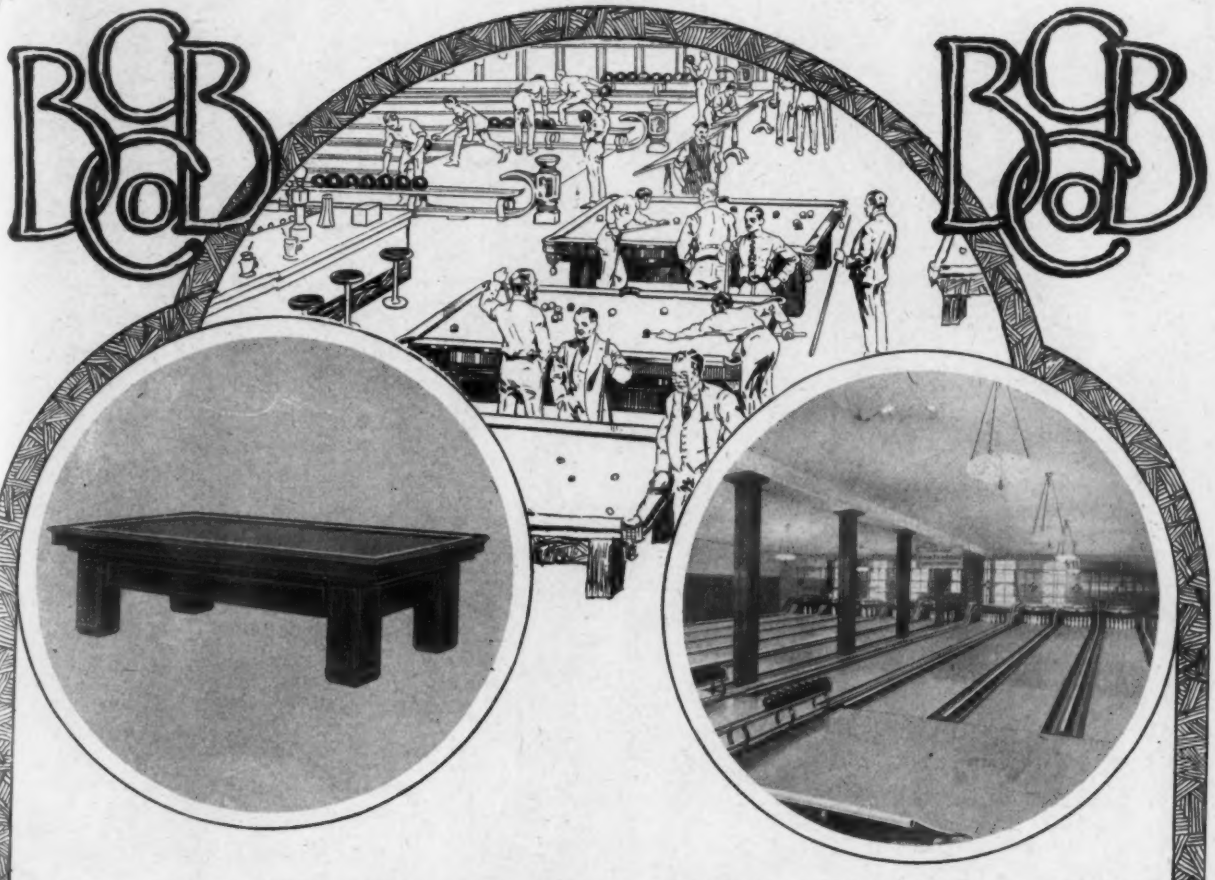
A modern Thomas equipped emergency room will put you also among the progressive owners who are saving money and advancing the conditions of their workers.

Write for information and advice, stating, if possible, the number and nature of your accidents.

SOUTHERN REPRESENTATIVE

F. H. THOMAS COMPANY

689-691 Boylston Street - Boston, Mass.



Try Out This Plan in Your Mill, Your Men Will Be Enthusiastic.

Numerous mills who have installed billiard tables and bowling alleys have found that their men take great pride in becoming good bowling and billiard players, and have formed bowling and billiard teams that keep the men contented and eliminate their desire to seek outside amusements in doubtful places.

Try this plan in your mill and inoculate your employees with the get-together spirit. Encourage their teams and probably offer prizes and cups for championship players. Show them you are interested in their welfare, and incidentally you will be increasing their health and productiveness as both bowling and billiards contain the proper exercise so essential to good health. Bowling is one of the best cures for indigestion and constipation.

Help your help—pay them a fair price for their work, give them the kind of recreation and amusement they like, and you will have healthy contented workmen which in turn will mean higher class work and larger production.

Our plan has been found a paying investment in many mills. May we send you full information and bowling and billiard catalogs?

BRUNSWICK-BALKE-COLLENDER CO.

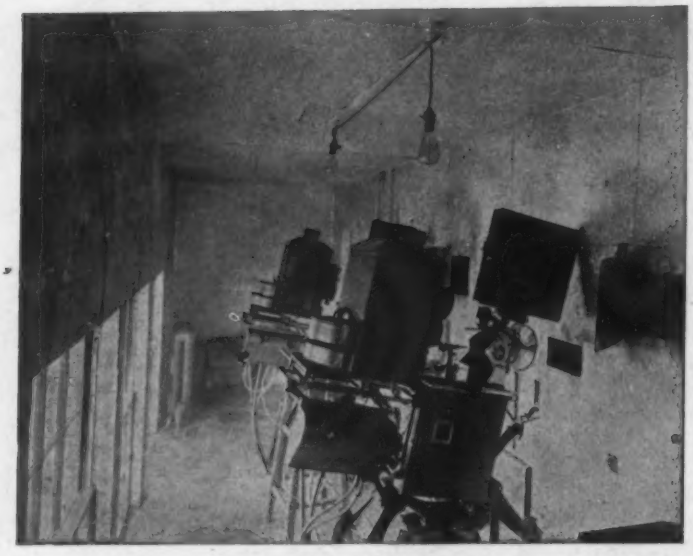
623-633 So. Wabash Ave., Chicago, Ill.
Branches in Principal Cities.

Brunswick

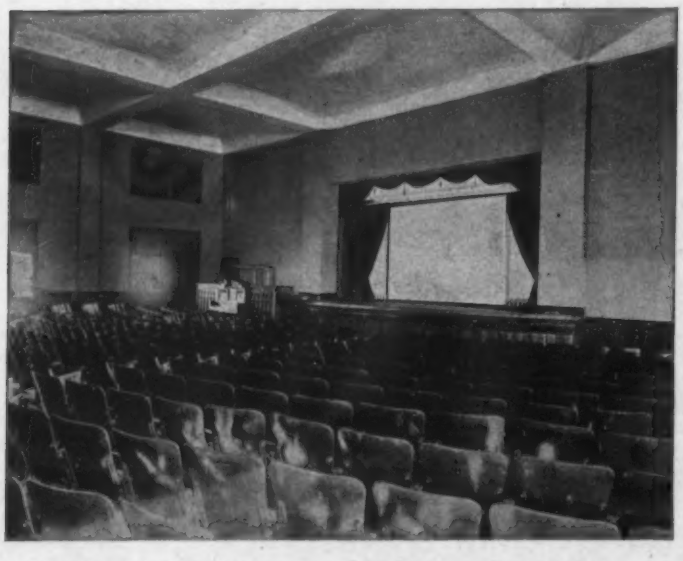
Billiard Tables and Bowling Alleys

Tables for Home and Residence Use.

Better Motion Pictures For Textile Mill Employees



Showing Installation of Power's 6 'B Motion Picture Machines in the Tucupau Mills Theatre.



Showing Interior of Tucupau Mills Theatre, Tucupau, S. C.

THE textile industry is demanding the best moving pictures for their employees, and that is why more

POWER'S PROJECTORS

are used by textile mills in the South than all other projectors combined.

Here Are a Few of the Mills Using Power's

Exposition Cotton Mill	Atlanta, Ga.
Bibb Manufacturing Co.	Columbus, Ga.
Bibb Manufacturing Co.	Porterdale, Ga.
Gainesville Cotton Mill	Gainesville, Ga.
Habersham Mill	Habersham, Ga.
Hillside Cotton Mill	LaGrange, Ga.
Manchester Mill	Manchester, Ga.
Milstead Mill	Conyers, Ga.
Thomaston Cotton Mill	Thomaston, Ga.
Roswell Manufacturing Co.	Roswell, Ga.
Trion Company	Trion, Ga.
Rocky Mount Cotton Mill	Rocky Mount, N. C.
Rodman-Heath Cotton Mill	Waxhaw, N. C.
Pomona Mills	Greensboro, N. C.
Cleveland Mill & Power Co.	Lawndale, N. C.
Spray Cotton & Woolen Mills	Spray, N. C.
Issaqueena Mills	Central, S. C.
D. E. Converse Co.	Glendale, S. C.
Monoghan Mills	Greenville, S. C.
Woodside Mills	Greenville, S. C.
Pacolet Manufacturing Co.	Pacolet, S. C.
Tucupau Mills	Tucupau, S. C.
Victor Mills	Greer, S. C.
Victor-Monoghan Mills	Seneca, S. C.
Victor-Monoghan Mills	Walhalla, S. C.
Victor-Monoghan Mills	Jonesville, S. C.
Ware Shoals Manufacturing Co.	Ware Shoals, S. C.
Glenn-Lowry Manufacturing Co.	Whitmire, S. C.
Lanett Mills	Lanett, Ala.
Indian Head Mills	Cordova, Ala.
Selma Manufacturing Co.	Selma, Ala.
Central Mills	Sylacauga, Ala.
Tallahassee Falls Manufacturing	Tallahassee, Ala.

Our experience in Theatre Equipment is at your service

"WE HAVE A SPECIAL OFFER"

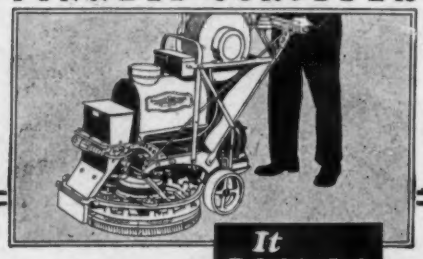
Southern Theatre Equipment Company

No. Nine Nassau St.
ATLANTA, GEORGIA

Eighteen Fifteen Main St.
DALLAS, TEXAS

"CLEAN FLOORS
Reflect Clean Business"

FINNELL SCRUBBER



It
SCRUBS
Electrically!

The Production Value of

CLEAN FLOORS

in American Business

RIVERSIDE AND DAN RIVER COTTON MILLS, INC.
Danville, Virginia
Where CLEAN FLOORS are helping to produce a CLEAN product under CLEAN conditions.

Well-informed executives know that happy workers are profitable producers. They know, too, that CLEAN, pleasant environment helps to keep workers healthy and happy.

The U. S. Department of Labor, in Bulletin No. 249, says, "Cleanliness and good order contribute to increased output as well as to discipline and morale of the factory."

The Metropolitan Life Insurance Company, in a booklet, entitled, "The Health of the Worker," says, "The bad conditions that exist in factories . . . keep the worker uncomfortable, they hinder his work . . . They are likewise harmful to the employer's interests, for he is a constant loser from poor and careless work, spoiled stock . . ."

Fortunately, executives are rapidly proving to themselves that cleanliness is essential to better production. They are learning that even the *floors* must be CLEAN—not just swept, mopped or hand-scrubbed with soda and water.

The Finnell System of Power Scrubbing, installed in a great variety of business institutions, is paving the way to greater efficiency by providing *really* CLEAN FLOORS.

For complete information, address inquiries to our Chicago offices.

AMERICAN SCRUBBING EQUIPMENT CO.

Also manufacturers of Finola Scouring Powder

General Offices: 188 N. Wabash Ave., Chicago Factories: Hannibal, Mo.

DISTRICT OFFICES

ATLANTA	BUFFALO	DENVER	LOS ANGELES	NEWARK	PHILADELPHIA	SALT LAKE CITY
BALTIMORE	CHICAGO	DETROIT	LOUISVILLE	NEW ORLEANS	PITTSBURGH	SAN FRANCISCO
BOSTON	CINCINNATI	INDIANAPOLIS	MILWAUKEE	NEW YORK	PROVIDENCE	SEATTLE
	CLEVELAND	KANSAS CITY	MINNEAPOLIS	OMAHA	ST. LOUIS	

FINNELL SYSTEM

OF POWER SCRUBBING

Wooden Packing Cases

All Styles
Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require. Our prices are very much reduced, try us.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.

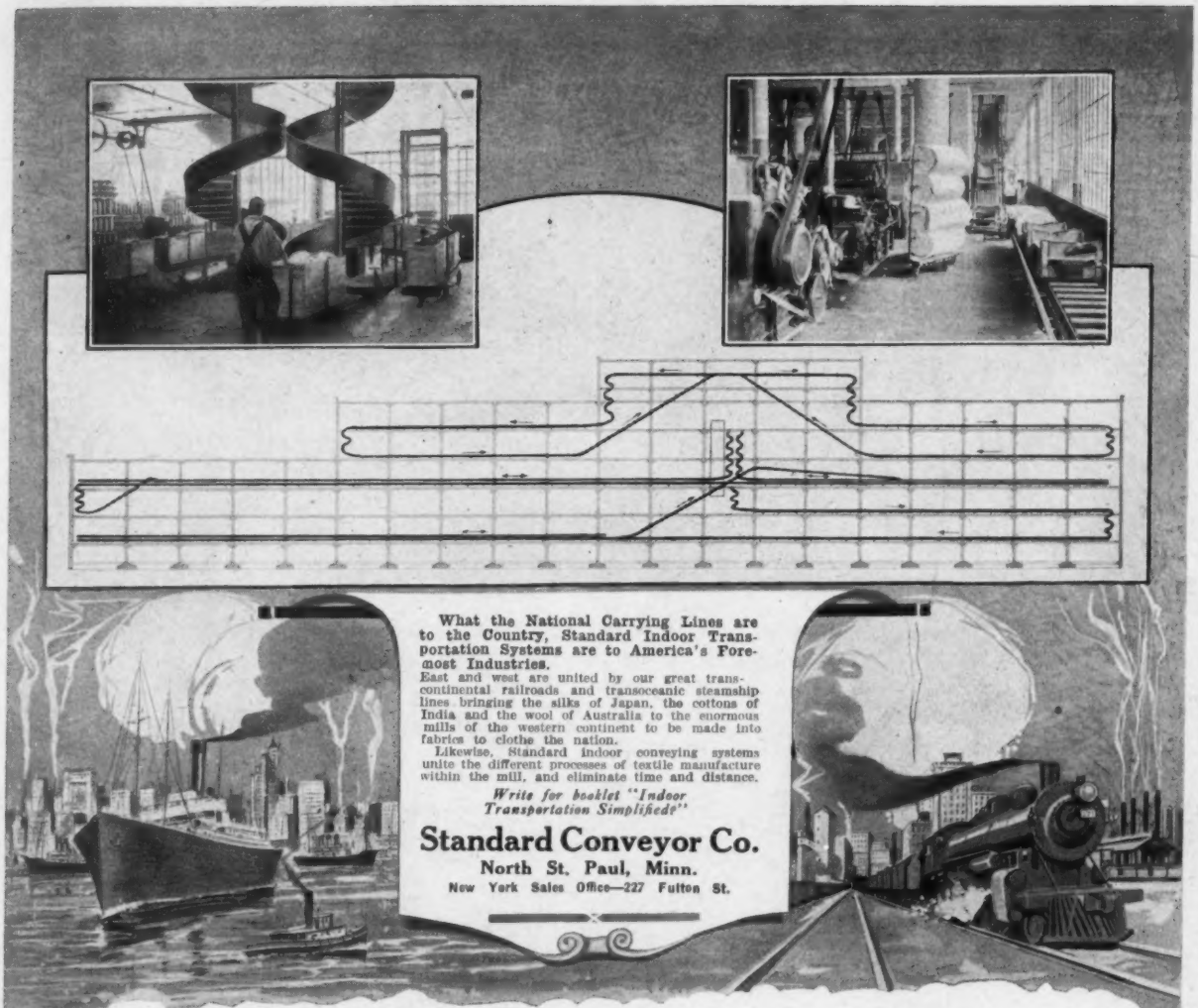
All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

Box 1025 **Atlanta, Ga.**



What the National Carrying Lines are to the Country, Standard Indoor Transportation Systems are to America's Foremost Industries.

East and west are united by our great transcontinental railroads and transoceanic steamship lines bringing the silks of Japan, the cottons of India and the wool of Australia to the enormous mills of the western continent to be made into fabrics to clothe the nation.

Likewise, Standard indoor conveying systems unite the different processes of textile manufacture within the mill, and eliminate time and distance.

Write for booklet "Indoor Transportation Simplified"

Standard Conveyor Co.

North St. Paul, Minn.

New York Sales Office—227 Fulton St.

What Standard Indoor Transportation Systems are Accomplishing in "The Jackson Mill" of the Nashua Manufacturing Company. Nashua, New Hampshire

Lockwood, Greene & Company, Engineers, reversed all previous ideas of textile mill planning when they put the picker room at the Jackson Mills near the roof. By starting at the top with the first process, the work flows naturally through the mill by gravity. Follow the course of the product through the mill and see where unnecessary handling and non-productive labor have been cut down.

The cotton, after leaving the bale breakers, is blown to the top floor where distributors place it automatically in the hoppers of the breaker pickers which are in two rows back to back, the delivery ends of the finisher pickers being on opposite sides of the room and very close to two lap conveyors which carry the picker laps to the two card rooms on the fourth and fifth floors. These two rooms are duplicates. The speeders are centralized on both sides of a broad alley in the center of the room and after going through these machines the product is ready to go by way of a double spiral chute to the third floor or spinning floor.

At convenient places in this floor are openings which lead to conveyors running respectively to the spoolers for warp yarn and the weave room for filling, and under these conveyors are others which return the empty boxes to the spinning room. From the weaving department conveyors carry the rolls of cloth out of the building. There is absolutely no trucking between floors and the greatest distance anything can be trucked is the width of the building.

It is estimated that with this type of mill, it will be possible to get an increased product of at least 25 per cent with the same working force that is used today. This is due entirely to the arrangement, which will make the work so much easier for each employee that with less effort, he can accomplish more.

(Sketch and explanation used through courtesy of "COTTON.")

No help needed here

THE McKinney One-Man Truck is two-man power. Boxes, bales and barrels move with a snap. The size, weight and shape doesn't matter. The McKinney method puts straining, tugging, labor and time waste out of order.

This truck is used for all types of merchandise. A man weighing 130 pounds can lift and move a load weighing 700 pounds—alone and with ease. There's nothing complicated about its operation. Throw the steel package holder over the box, bale or barrel, pull back on the handles and the load is on its way. You get speed here!

Another feature. Where motor trucks are used in moving merchandise, this truck can travel with the load and serve at both ends of the trip. Stops are cut short and motor expense cut down.

The McKinney One-Man Truck is made of steel—light but rugged. It is built narrow gauge to fit narrow stacking aisles. With it one man can easily pick up, haul and unload heavy and bulky merchandise without a single stroke of assistance.

Why let two men do the work one can do? Cut your trucking costs in half. Speed up the work, stop delays. The story of the McKinney One-Man Truck Service is graphically told with pictures in the booklet "The One Man Method". We will gladly send this booklet upon request.

Our illustrated catalog, "The One-Man Method," will answer your particular trucking problem. Send us your name and address and we will forward you a copy of this interesting booklet.

McKinney Manufacturing Co.
Pittsburgh

Export Representation
The Lovingood Co., Atlanta, Ga.

Also manufacturers of McKinney Hinges and Butts, garage and farm building door-hardware and furniture hardware.

McKINNEY *one-man* TRUCKS

PACKARD

They Haul More for Less

From fields busy with the picking, to gin and press, from warehouse and loom to loading dock or platform, Packard trucks are serving the cotton industry with that dispatch, reliability, and unusually low ton-mile cost for which they are everywhere noted.

Take as an example of their service the record of three Packard ED trucks, with trailers, operated by the Augusta Truckage Company, of Augusta, Georgia.

They make two trips per hour between cotton row and compress, a distance ranging from 2½ to 3½ miles. On each trip 18 tons of cotton are hauled.

The consistent ability of Packard trucks to do the most work at the lowest cost is known in every field of hauling. It is the result of correct engineering, precise manufacture, and scientific specification to the job.

PACKARD MOTOR CAR COMPANY · Detroit

Ask the man who owns one

Costs More but—

Cocheco Belting costs more than some other brands, that are sold on a price basis, but—IT'S WORTH EVERY CENT OF DIFFERENCE for it will last longer.

This product is made from the choicest center sections of carefully selected butts and is tanned by the oak bark process. For 77 years it has answered satisfactorily every demand in hundreds of plants equipped with products of a better grade.

No belting is made which can be called superior to Cocheco. If you are looking for belting which transmits maximum power at minimum upkeep expense you will eventually select Cocheco Belts.

I. B. Williams & Sons

Dover, New Hampshire

Branches: New York, Chicago, Boston

COCHECO BELTING

SKF
Research Laboratory established at Philadelphia to co-operate with the Gothenburg Laboratories in the study of the American Manufacturers' friction problems.

THE technical advice brought you by our engineers embodies the experience of highly trained organizations in all parts of the world in the solving of friction problems.

This international experience is both technical and practical and is acquired in co-effort with the best international research endeavor.

SKF service in America is linked to this international experience. Its tangible evidence is found in products marked "**SKF**" and in the advice supplied you by our engineers.

SKF Industries, Inc.

165 Broadway, New York City

Supervising at the request of the stockholders.
- The Hess-Bright Manufacturing Co.
- SKF Ball Bearing Co.
- Atlas Ball Co.
- Hubbard Machine Co.
- SKF Research Laboratories

THE MECHANICAL APPLIANCE COMPANY

WAYNE

July 28, 1920

S K F Industries, Inc.,
165 Broadway,
New York City

Gentlemen: Att. Mr. H. H. Brenner - Chief Engr.

Replying to your letter of July 22nd, we were very much pleased with Mr. ******'s visit and report and we know that we can profit thereby. Aside from his recommendations relative to ball bearings he was able to suggest minor changes in our methods of manufacturing which we believe will result in a decided saving. We think that an expert from the outside can come into any factory and make valuable suggestions for improvements. We all become used to our own methods of manufacturing and very often overlook obvious improvements.

We think that you are doing a very real service to your customers in employing a man of Mr. ******'s caliber to make these inspection trips. Mr. ****** or any other representative of your company will always be welcome in our factory.

Yours very truly,

THE MECHANICAL APPLIANCE COMPANY

(Signed) R. G. Kellog,
Vice President

RGK-EC

C/Louis Allis

618

SKF

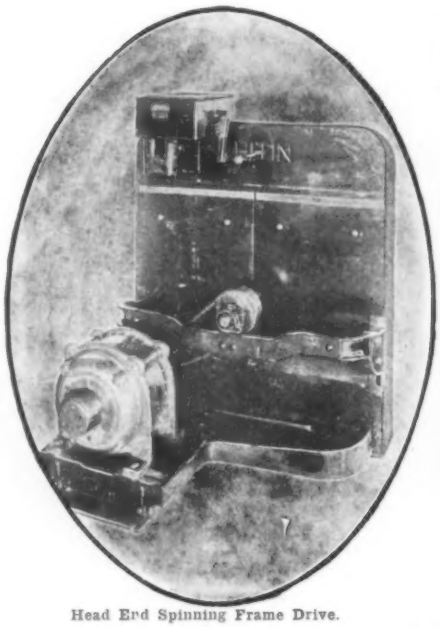
Among these products now offered are:

Single row deep groove ball bearings. Thrust bearings. Steel balls.
Double row self aligning ball bearings. Transmission equipment.

Rocker Joint,

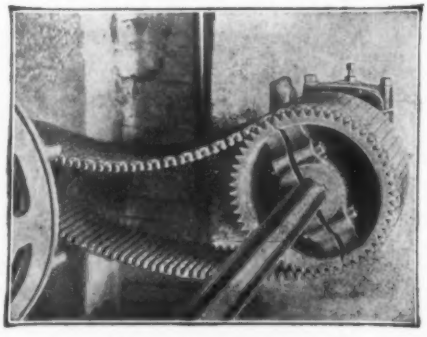
MORSE SILENT C

Guide Links wear show alignment of Drive.



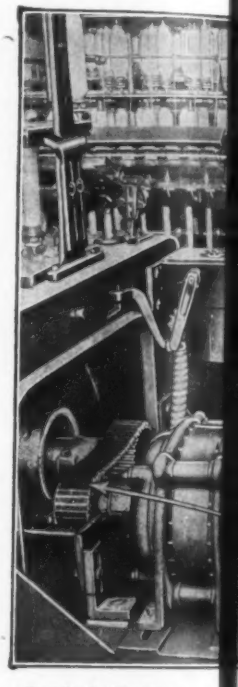
Head End Spinning Frame Drive.

Flexible as a Belt
POSITIVE SPEED RATIOS



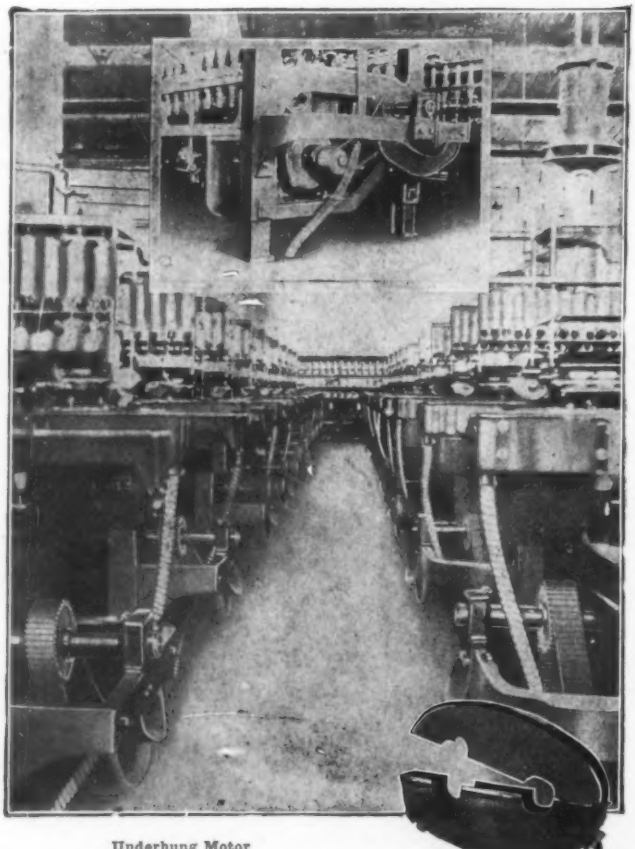
Typical Line Shaft Drive
Cotton Gin and Oil Mill.

The Ideal T



Standard Spinning
Chain ½″ Pitch.

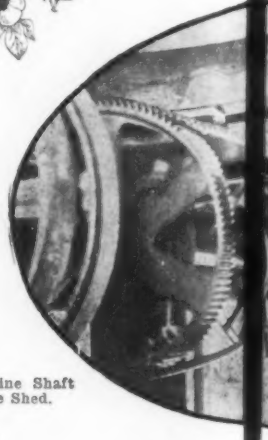
Durable and Long Life
UNIFORM SPEED INCREASING
PRODUCTION



Underhung Motor
Spinning Frame Drive.

Drawn-Steel Chain Case.

99%



Overhead Line Shaft
in Weave Shed.

The Chain with
The Rocker Joint
and Center Guide

Benefit by MORSE S

THE MORSE ROCKER JOINT

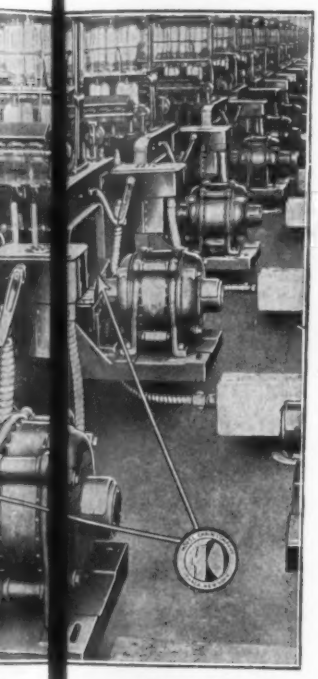
oint, Wsahers Removed.

CHAINS IN TEXTILES

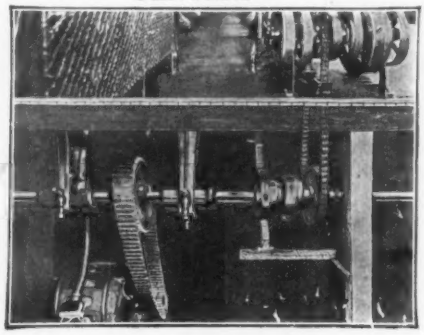
Textile Drive

Positive as Gears

SAVE FLOOR SPACE BY SHORT CENTERS

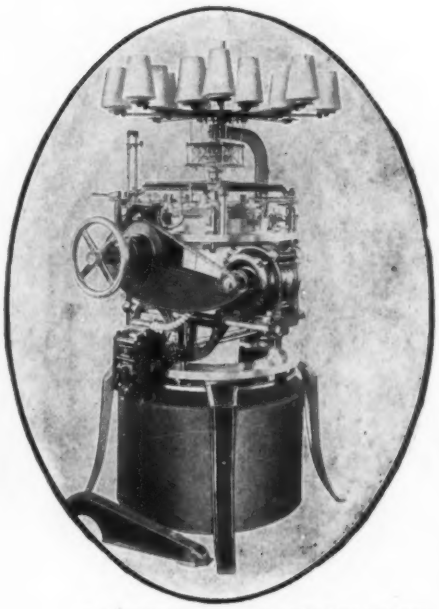


Spinning Frame
2½" wide, 8½" centers.

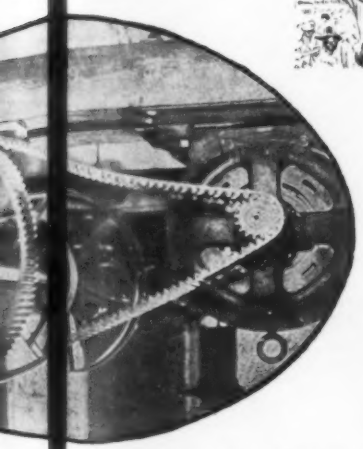


Motor to Line Shaft Under Floor
Through Floor to Twisters.

No Baths of Oil or Heating
SMOOTH RUNNING
IMPROVING QUALITY

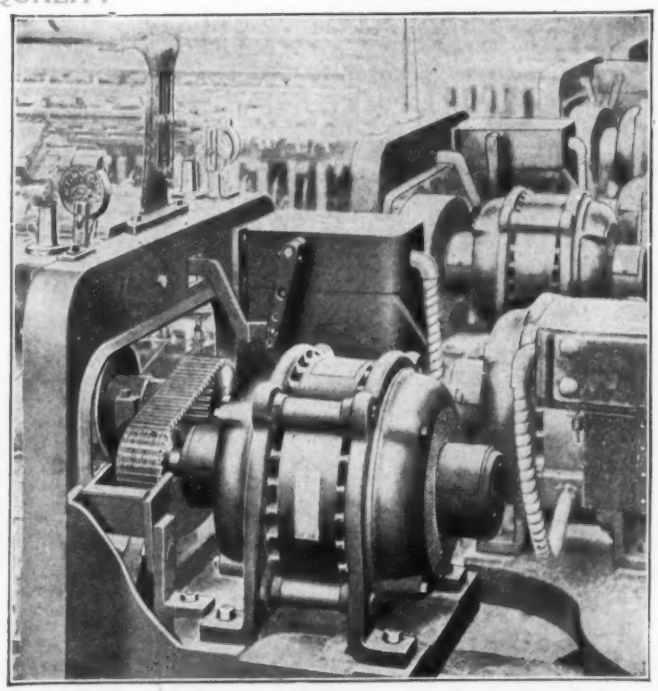


Individual Motor Drive to Knitting Machine



No Flanges
No Oil Baths

SERVICE as others do



Close Setting, Standard Spinning Frame Drive.

Guide Links maintain aligning of Drive.

ENGINEERS PLANNING POWER TRANSMISSIONS

Secure Data and Estimates of "MORSE" DRIVES

SAVE Construction, Space, Light, Fuel. Producing More with Less

MORSE CHAIN CO., ITHACA, N. Y.

Engineering Service. Assistance Bulletins

Baltimore	Kansas City	Philadelphia	St. Louis
Boston	Detroit	Pittsburgh	Montreal
Chicago	Charlotte, N. C.	San Francisco	Minneapolis
Cleveland	New York	Atlanta	Toronto

Strom Bearings
Reduce Slippage On Measuring Rolls

Strom bearings are especially adaptable for use on warper measuring rolls. They consist of a small number of large, perfect balls, running in highly polished grooved races.

They give a frictionless service which prevents slippage, thereby reducing the amount of wasted yarn.
Many users have found that this application of Strom bearings saves as much as two pounds of waste on a set of seven beams. A much smaller saving would soon pay for the bearing.

Strom bearing equipment especially designed for various textile machines can be obtained through our Southern distributors, the Aldrich Machine Works, Greenwood, S. C.

Radial bearings made in a wide range of sizes for light, medium and heavy duty. Angular contact bearings especially designed to support combinations of radial and heavy end thrust loads. Thrust bearings made in all types and sizes with flat and grooved races.

U. S. Ball Bearing Mfg. Co.
(Conrad Patent Licensee)
4544 Palmer St., Chicago, Illinois.

82

Strom BEARINGS

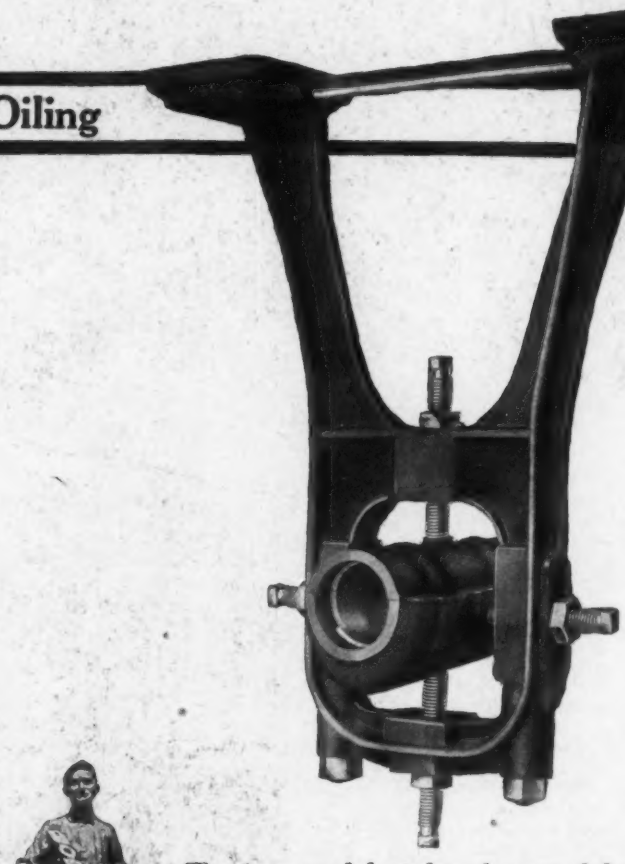
Oneida 4 Point Hanger

AMPLY STRONG AND EASY TO ERECT

Vertical and Horizontal Adjustment

Ring Oiling

4-Piece Bearing



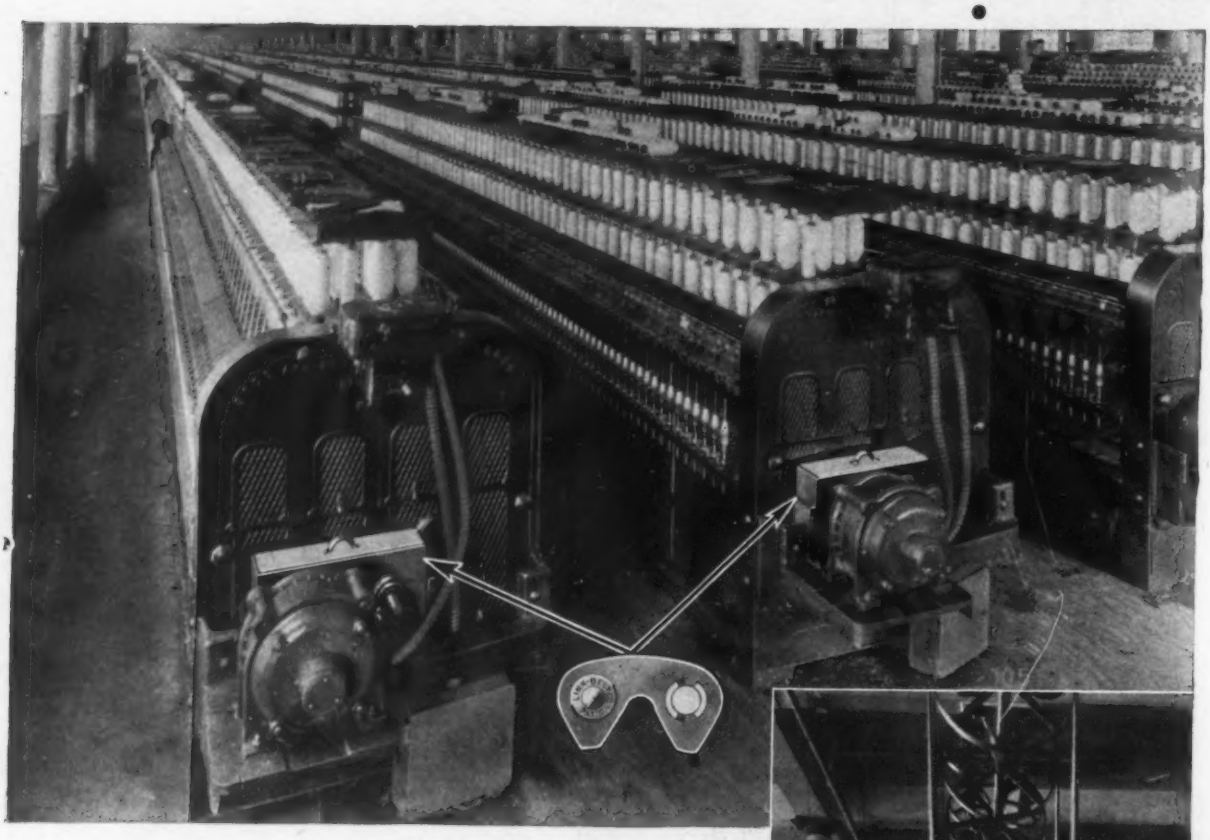
The improved bored and reamed bearing is an exclusive feature in the Oneida 4 Point Hanger. The four-way adjustment in the hanger frame, together with the ball and socket outer casing of the bearing provides a true universal movement in which self-alignment is successfully obtained.

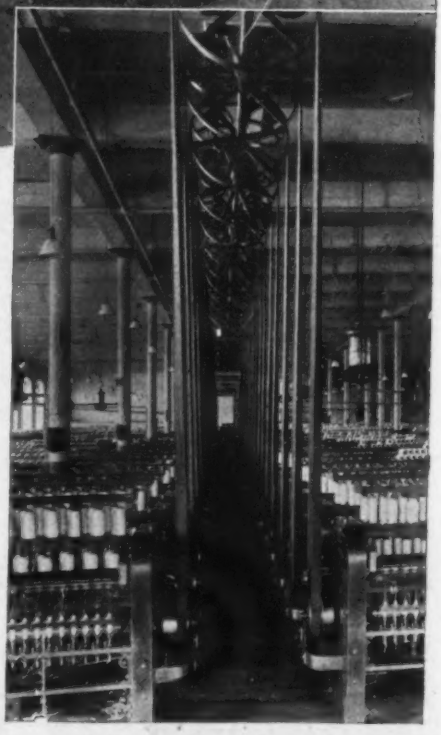
The efficient distribution of metal at points where the greatest strain occurs renders the Oneida at least 30% stronger than any other 4 point hanger on the market.

DODGE

Dodge Sales & Engineering Company, distributor of the products of the Dodge Manufacturing Company and the Dodge Steel Pulley Corporation. General Offices: Mishawaka, Ind. Works: Mishawaka, Ind., and Oneida, N. Y.
Canadian Plant: Dodge Mfg. Co. of Canada Ltd., Toronto and Montreal

Philadelphia Cincinnati New York Chicago St. Louis Boston Atlanta Pittsburgh Minneapolis Dallas Providence Seattle Newark





Flat Belts or Silent Chain

Which Do YOU Use?

THE flat belt drive, an ancient offender against efficiency, is being rapidly superseded in Textile Mills by Link-Belt Silent Chain Drives.

Here is shown a fair comparison of the two methods of transmitting power on the same job: Above, Link-Belt Silent Chain; at the lower right, ordinary flat belt drives.

Link-Belt Silent Chain is "Flexible as a Belt, Positive as a Gear, More Efficient Than Either". Our Silent Chain Drives are protected by dustproof and oil-tight casings. They are unaffected by atmospheric conditions.

You know all about flat belt drives. Compare the performance of belt drives with the 98.2% efficiency of Link-Belt Silent Chain Drives. Compare the menace to workers of the belt drive with the safety of the Silent Chain Drive. Compare the details of the two scenes pictured.

Now choose your drive!

Write for Book No. 425 on Link-Belt Silent Chain Drives for Textile Mills.

LINK-BELT COMPANY 437

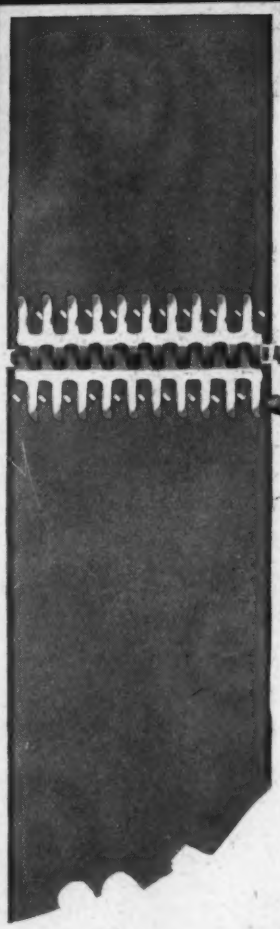
PHILADELPHIA CHICAGO INDIANAPOLIS

ATLANTA, GA. - - 707 Citizens & Southern Bank Bldg.

CHARLOTTE, N. C. - - J. S. Cothran, Commercial Bank Bldg.

LINK-BELT
SILENT CHAIN DRIVES

The World's Greatest Belt Lacing



Simple, Strong, Economical
—Preferred by All Who Know It!

Under every imaginable condition of service—in every civilized country in the world—**on every kind of leather, cotton, rubber or balata belt**—Alligator Steel Belt Lacing has proven its **unquestioned supremacy during the past eleven years.**

So, whatever your experience in belt lacing, consider carefully the **100% efficiency** of Alligator Steel Belt Lacing in satisfying your requirements. Then, if you can see in it a probable advantage, write us for samples and prices or use the coupon below.

—"Never Lets Go"

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING

Nothing Needed But a Hammer

In a working time of only three minutes the average belt can be laced with Alligator Steel Belt Lacing. No special skill or training needed. No tool but a hammer to insure a perfect joint. Consider this saving over other methods of lacing, the time of the man who handles the job, the time of those who are idle while the lacing is being done and the time of the machine.

Alligator Steel Belt Lacing also saves the belting The pull comes against the edge of the teeth and not the flat. Leather belting is not weakened nor the fabric belts injured as with other lacings by cutting the long threads which carry the "pull." Alligator Steel Belt Lacing becomes a permanent part of belt—does not pull out—and replacements even in hardest use are practically unknown.

A Large Surplus of Strength

Note the **double staggered teeth** (shown in illustration)—they give the extra strength to Alligator lacing. See how the long end teeth pierce the belt and are "clinched" tightly with the hammer. The result is that Alligator Steel Belt Lacing has proven time after time the strongest lacing in the world. **There is no stronger lacing known.**

Best for Every Service

Everywhere in Industry, where belting is required—whether Manufacturing, Agriculture, Lumbering, Mining or Milling, Alligator Steel Belt Lacing is known and is preferred by all who know it.

The short flexible joint insures smoothness of operation. One very important feature is the Sectional Steel Rocker Hinge Pins (patented)—special steel rods with lugs spaced to correspond to sections in the lacing. Lugs hold them in place and oval faces form frictionless "rocker" for the flexible joint. In damp or heavy work, where other lacings pull out, Alligator Steel Belt Lacing holds.

Ask Your Jobber—or Write Now for Prices, Samples and Full Details

Write today—or use the coupon. Let us quote you prices and send samples and full details regarding Alligator Steel Belt Lacing. Made for belts of all sizes from tape to ⅝ inch thickness.

Hundreds of thousands of men the world over are now recommending and using no other lacing than Alligator—The World's Greatest Belt Lacing. It will be a big saving, a great discovery—a wonderful convenience for you. Use the coupon. Tear it off now. Write us at once.

Send This Coupon

Flexible Steel Lacing Company
4619 Lexington St., CHICAGO

Gentlemen—Kindly send price lists, sample and complete details of Alligator Steel Belt Lacing. Also send prices and descriptions of Flexco

Lok Lamp Guards.....
(Check if Desired)

Firm Name.....

Address.....

Name of Inquirer.....

(Tear this Coupon Out—Send It Today)

FLEXCO-LOK STEEL LAMP GUARDS

Produced in connection with our Alligator Steel Belt Lacing, and sold at a decided saving as a mechanically perfect guard.

In all sizes—standard brass or weather-proof sockets, with or without reflectors.

Either portable or stationary types, with patent self-retaining lock screw or plain round head screws. Not stocked in London

FLEXIBLE STEEL LACING COMPANY

4619 Lexington Street :: CHICAGO, ILLS., U. S. A.
135 Fi-sbury Pavement London, E. C. England

"Pioneer" STEEL HANGER

"I've handled all kinds of hangers since I started millwrighting; but these 'Pioneer' Steel Hangers are my choice. Why? The answer's easy. I can hang them all day and alone if necessary. These old-fashioned cast-iron hangers seemed to weigh a ton around three o'clock in the afternoon. It took three of us to handle them, too. It's different now; the boss uses 'Pioneer' altogether. They're safe; and I never yet heard of a 'Pioneer' coming down — and that's a mighty good point. The difference in first cost is in favor of the 'Pioneer,' so they are preferable every way you look at them."

Ask for our booklet "Transmission Data." It's worth reading.

"I'll Take the Steel Hanger Every Time"

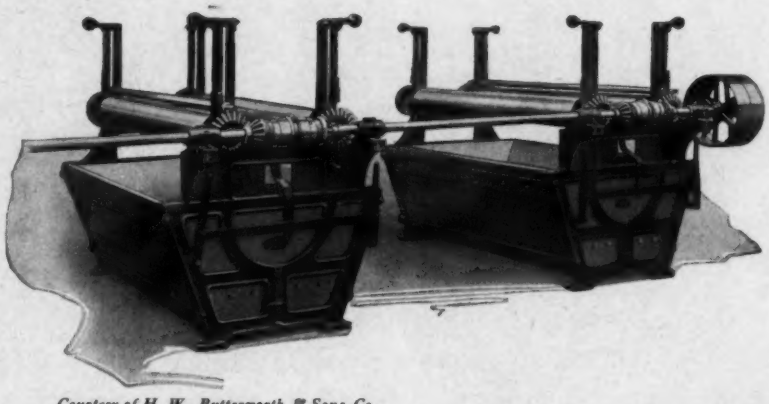
STANDARD PRESSED STEEL CO.

PHILADELPHIA, U. S. A.

THE JOHNSON FRICTION CLUTCH

Pioneer Textile Machinery Builder Uses Johnson Clutches

An Installation on Butterworth Dyeing Jiggers



Courtesy of H. W. Butterworth & Sons Co., Philadelphia, Pa.

H. W. Butterworth & Sons Company is one of the oldest concerns building textile machinery, and Butterworth machines are among the finest made. It is only natural then, that the clutch they use should be a Johnson. They have found the best through experience.

The Johnson Clutch has been applied with good results on many other types of textile machinery, particularly for use with individual motor drive or group drives from counter shaft. It has been found entirely satisfactory for work of this kind.

Let us show you the advantages of using Johnson Clutches in the textile plant. Write for our Catalog "G" and our Booklet "Clutches As Applied to Machine Building."

Double Clutch Exterior.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

"Niagara" Brass Grease Cup

Steam Engineers Say:

"Standardizing on Sherwood Specialties Reduces Our Work"

These engineers know that success in building steam engines, locomotives, and myriads of mechanical things comes from standardization—and they utilize this knowledge when selecting engineering specialties.

Consequently, it is only natural that these engineers select engineering specialties which embody the improvements of twenty-five years experience. They back their judgment by standardizing on Sherwood.

And their impressive experience with Hart Oil Pumps, Sherwood Injectors, and Eagle Ejectors has made them ardent advocates of the entire Sherwood list.

Also, these engineers discovered, just as you will, that standardizing on Sherwood specialties means a big saving of time and of money—speeds up repairs—and reduces their work.

Have you received a copy of the Sherwood Book? It is well worth reading.

Write your name and address on the margin of this page, forward it to us, and we will send the Sherwood Book to you by return mail.

6.

SHERWOOD MANUFACTURING COMPANY
Brass Founders and Finishers
BUFFALO, N. Y.

SHERWOOD
ENGINEERING-SPECIALTIES

The End of a Difficult Problem

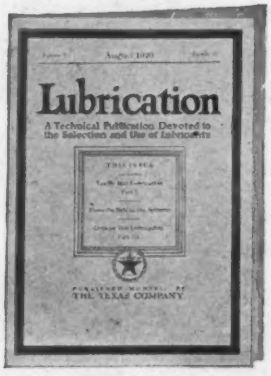
For a long time in a large number of mills, the successful lubrication of comb boxes has been a difficult problem. And for a peculiar reason.

And this was largely because so many textile mill engineers have been content to follow the custom—or the habit—of using a heavy lubricant in the boxes.

There was no real reason for this and we have demonstrated this conclusively with Texaco Comb Box Lubricant.

Now, as you know, a comb box contains an eccentric, and on some types of comb boxes, there are two, driving the comber shaft at a speed of 1500 to 2200 r.p.m.—a combined sliding and rotating movement.

These eccentrics run in a bath of lubricant and as the comb is usually set within 0.005 inches of the doffer cylinder, it is absolutely essential that the comb box, within which the eccentrics are located, be kept at an even temperature to maintain the exact adjustment of the comb from the doffer cylinder and the even running of the sliver. It is only by maintaining this distance exactly that the sliver runs even.


Lubrication
A Technical Publication Devoted to the Selection and Use of Lubricants
PUBLISHED MONTHLY BY THE TEXAS COMPANY

In this magazine we print month after month, articles covering the problems of lubrication as applied to various industries.

These articles are not theoretical, but based on practical operating experience.

We shall send "Lubrication" to Engineers, Executives, Buyers of Lubricants and others, who are professionally interested and who ask for it—FREE—for the time being. Write for it.

TEXACO COMB BOX LUBRICANT

shows what can be accomplished by engineers who are not content to follow the beaten path

Texaco Comb Box Lubricant is made especially for the purpose and meets operating conditions perfectly. It brings with it the freedom from mechanical difficulties in the comb box and because of its long life, is exceptionally economical.

Texaco Comb Box Lubricant is different from other products offered for sale or now in use, and to prove conclusively that it is adequate for the work, we have only to cite two points:

1. **One filling of Texaco Comb Box Lubricant lasts two or three times as long as the other kinds.**
2. **In every case we have shown that with Texaco Comb Box Lubricant there is a considerable reduction in frictional temperature in the box. Sometimes this difference exceeds 15 degrees.**

There is a Texaco Lubricant for Every Purpose

Other Texaco Textile Mill Lubricants are:

Texaco Loom Oil, Texaco Rabtex Spindle Oil, Texaco Top Roll Lubricant, Texaco Engine Oils, Texaco Machine Oils, Texaco Turbine Oils, Texaco Cylinder Oils, Texaco Gear Lubricants.

THE TEXAS COMPANY

Dept., O, 17 Battery Place, New York City, N. Y.

Atlanta Houston Chicago

OFFICES IN PRINCIPAL CITIES.

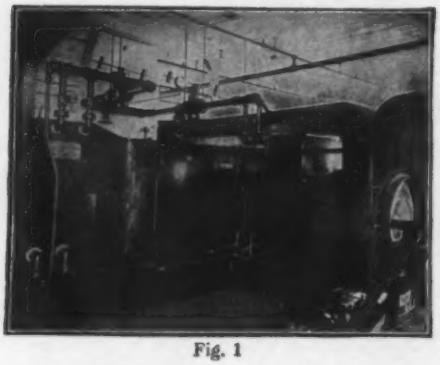


Fig. 1

Fig. 6

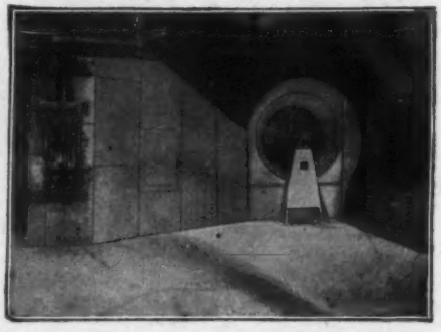


Fig. 8

American Blower Co. Products

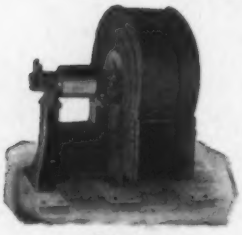


Fig. 2

Fig. 3

Fig. 4

Fig. 1—"Sirocco" System of Office Building Heating, Ventilating, Purifying and Cooling.

Fig. 2—Type "E" Exhaust Fan for Exhausting and Conveying Systems.

Fig. 3—"Sirocco" Electric Utility Blower, built in three sizes, for ordinary lamp socket attachment.

Fig. 4—Type "P" Special Steel Pressure Blower for supplying blast to cupolas and furnaces.

Fig. 5—"Sirocco" System of Heating, Ventilating, Cooling and Drying, installed in Factory Building.

Fig. 6—"Sirocco" Multi-Blade Patented Fan Wheel.

Fig. 7—Detroit Tilting Steam Trap—built in Return, Separating, Vacuum and Condensing Types. Used for automatically returning condensation from steam lines directly to boiler without pumping.

Fig. 8—"Sirocco" System of Heating and Ventilating for Public Buildings.

Fig. 9—Type "V" Universal Blower and Exhauster. Entirely reversible as to angle of air discharge with either right or left hand drive. Built for motor or pulley drive.

Fig. 10—"Ventura" Disc Ventilating Fan for handling large volumes of air at low power costs.

Fig. 11—"ABC" Vertical Enclosed Self-Oiling Steam Engine, direct-connected to electric generator. The engine is high speed and of high efficiency—especially adaptable for direct connection to Fans, Centrifugal Pumps, Stokers, Generators, etc.

Fig. 12—"Sirocco" Mechanical Draft Fans supplying draft to two of the largest boilers in the world—2,365 H. P. each.

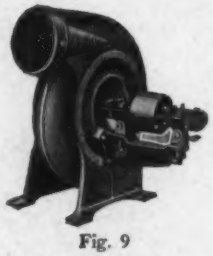


Fig. 9

Fig. 10

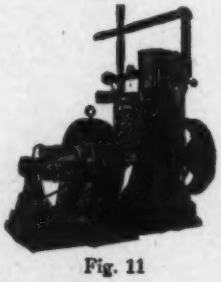


Fig. 11

AMERICAN BLOWER COMPANY

DETROIT, MICH.

"Sirocco"

Fig. 5

Fig. 7

Fig. 12

The Scoop Conveyor —Proven Performance

THE economical moving of materials by means of the Scoop Conveyor is not a matter of guess, but a fact actually established and many times proven by the performance of thousands of scoop conveyors now in actual and successful operation in all parts of the world.

It saves time, labor and money in storing and reclaiming, in loading and unloading—cars, trucks and wagons.

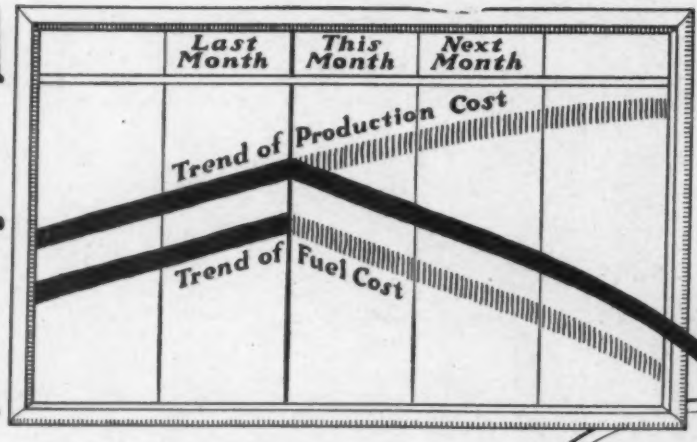
Let us show you conveying efficiency and how to add into your investment one more factor of speed and economy.

Send for Catalogue No. 56.

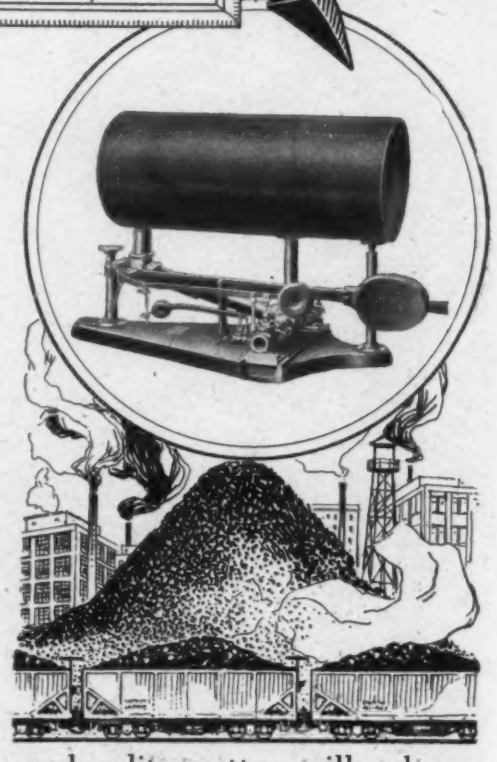
Portable Machinery Company
Passaic, N. J.

Ask Any User

Bend Your Cost-Line Down



Save 20% on COAL



It's because the Morehead Back-to-Boiler System drains all condensation from steam heated equipment as it forms—and returns the boiling hot water direct to your boiler—that Morehead installations are decreasing fuel consumption 20 per cent.

With the Morehead Back-to-Boiler System automatically removing the condensation, steam heated surfaces are kept constantly working at highest temperature and consequently maximum capacity. And practically all the heat in the condensation is conserved for use in the boiler—the only place in the plant where it can be used without loss.

We will gladly refer you to Morehead users in your locality, cotton mills whose average fuel saving is 20 per cent.

Write for catalog.

MOREHEAD MANUFACTURING CO., DETROIT, MICH.

Canadian Morehead Mfg. Co., Woodstock, Ont. For Dominion of Canada.

The "Morehead" Return Trap.

Positively Drains All Types of Steam Apparatus

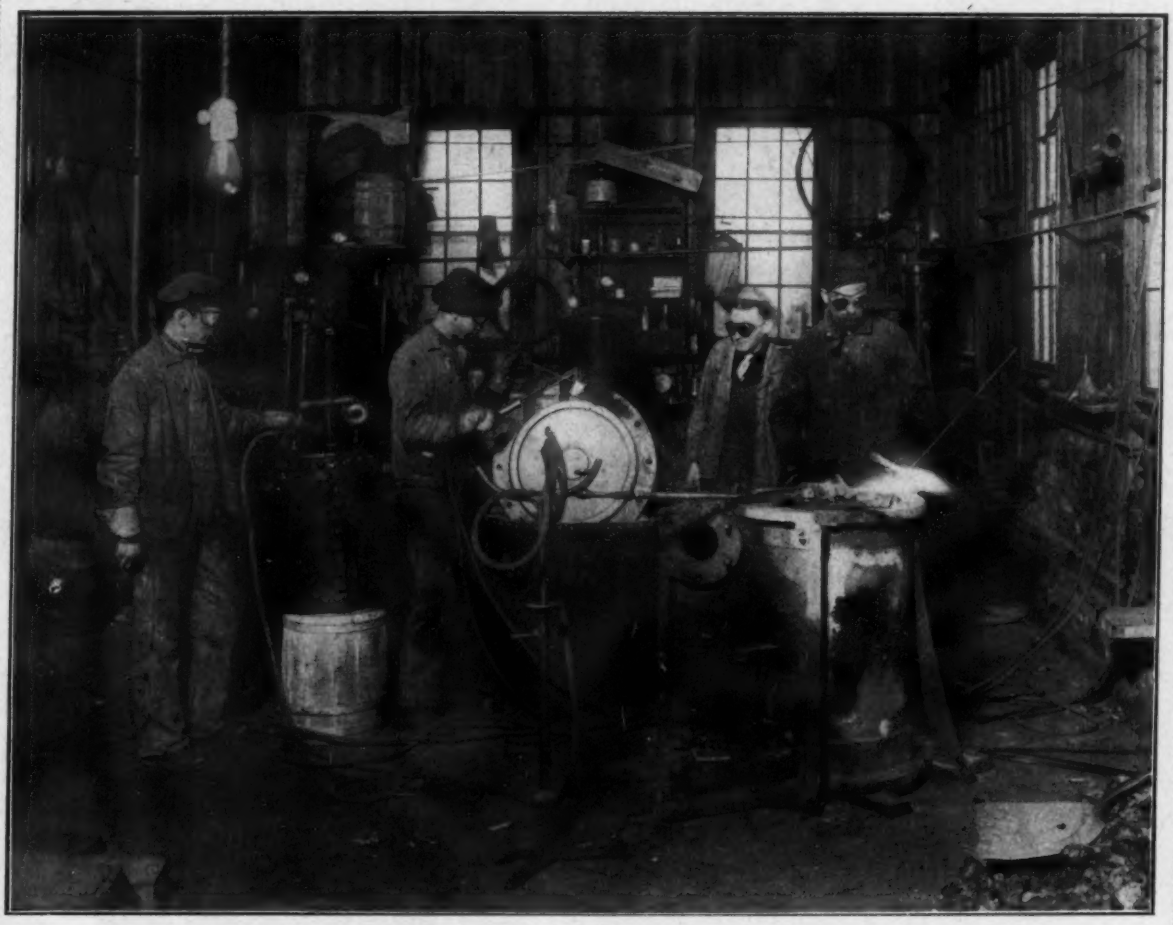
Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature

Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

QUICK WELDING SERVICE



Welding a cylinder, 2000 lbs. and cylinder head 3 inches thick—weld 20 inches—for Block Coal Co., Block, Tenn.

Don't Discard Your Broken Parts Our Service Saves Time and Money

There is no need of discarding broken machines and machine parts—there is no need of shutting down and waiting an indefinite length of time for delivery of new parts.

Many mills know through experience that should a machine break-down occur, it can be put back in operation quickly by calling on AUTOGENOUS.

We have just completed the repair on the crosshead and main bearing of a 1200 H.P. engine for the Brookside Cotton Mills. Practically every cotton and knitting mill in the vicinity of Knoxville has taken advantage of and profited by AUTOGENOUS Welding Service. Many of these jobs were extra large and caused a shut-down of the plant, and much time was saved by our quick service.

No matter how bad the break, no matter how small or large the machine or part, AUTOGENOUS Welding Service can save you money.

Full Details Sent on Request

WIRE, PHONE OR WRITE

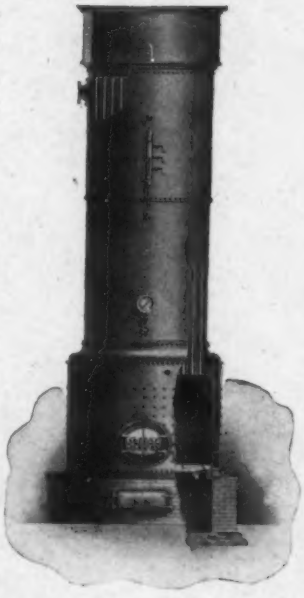
AUTOGENOUS WELDING COMPANY

Oxy-Acetylene Welding and Cutting in All Metals.

903-5 NO. CENTRAL AVE. JUNCTION CENTRAL AND BROADWAY, KNOXVILLE, TENN.

The Choice of Experienced Engineers

The vertical tubular type of boiler has long been preferred by the "old heads" in the steam plant, especially in the New England States, because with this type of boiler there is less floor space required, less grate surface and less fuel required.



Lately there has been an increased demand for this type of boiler, due to the call for higher steam pressures and also to the increasing use of steam turbines requiring superheated steam for their economical operation.

These Vertical Tubular Boilers combine all the best features of the Vertical Tubular Boiler. In the arrangement of heating surface, grate surface and passage of gases we have embodied in our design proportions which practice has proven correct.

The illustration shows our Standard Manning Type. Provision is made for cleaning the crown sheet through a series of handholes arranged to come opposite alternating rows of tubes so that it is possible to reach every part of the sheet.

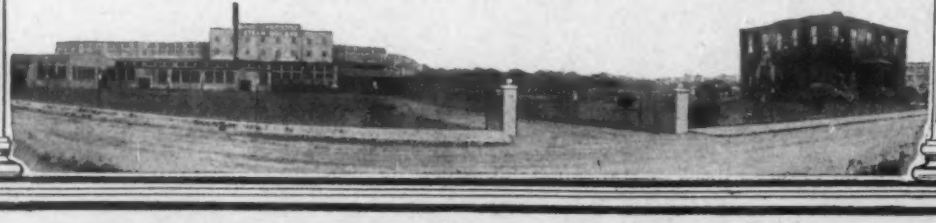
We ebuilt vertical tubular boilers in the Straight Shell type and the Tapered Course Type, both of which are perfected to the last degree and are giving satisfaction to every user. They are built to meet all the rigid requirements of the Massachusetts Board of Boiler Rules, and the ASME Code. Materials and construction live up to the reputation of all International products.

Write today for a Catalog. Every engineer should keep a copy for reference.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative: Isaac Hardeman, Charlotte, N. C.

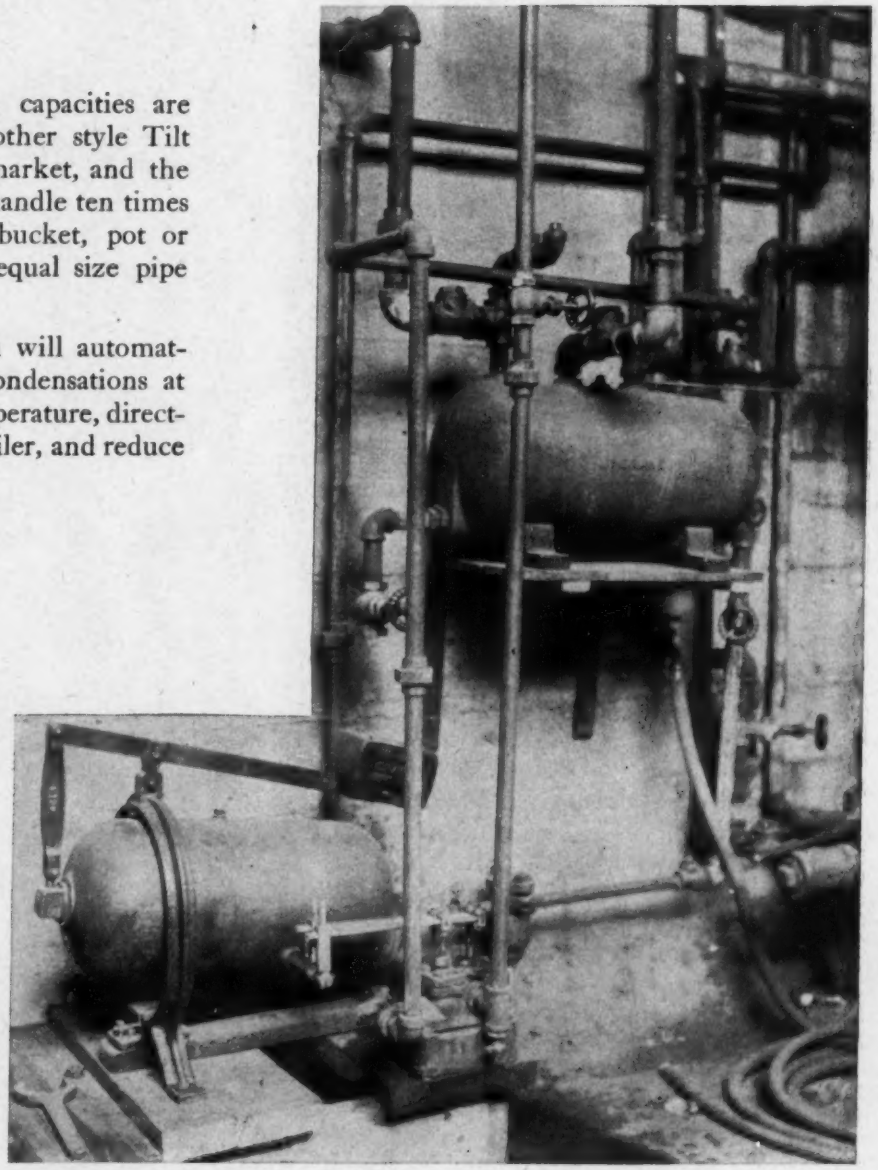
Boston New York Philadelphia San Francisco



CRANETILT STEAM TRAPS SAVE COAL

Their discharging capacities are greater than any other style Tilt Trap now on the market, and the Non-Return will handle ten times more water than bucket, pot or float traps having equal size pipe connections.

The Direct Return will automatically return all condensations at any pressure or temperature, directly back into the boiler, and reduce your coal bills.



We are manufacturers of about 20,000 articles, including valves, pipe fittings, and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors of pipe, heating and plumbing materials.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:
BOSTON, SPRINGFIELD, BRIDGEPORT, ROCHESTER, NEW YORK, ALBANY, BROOKLYN, PHILADELPHIA, READING, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI, INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, ST. PAUL, MINNEAPOLIS, WINONA, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

FOUNDED BY R. T. CRANE, 1855
CRANE CO.
836 S. MICHIGAN AVE.
CHICAGO

WORKS: CHICAGO AND BRIDGEPORT

CRANE LIMITED MONTREAL, TORONTO, VANCOUVER, WINNIPEG, LONDON, ENG., SYDNEY, N. S. W., QUEBEC, HALIFAX, OTTAWA, CALGARY.

Cozy-Attractive-Economical Homes

for Industrial Villages

QUICKBILT BUNGALOWS

Manufactured in large quantities, after patented methods. Especially adapted to industrial villages. Used by many of the largest corporations.

Thoroughly substantial. Costs less than half the ordinary house. Quickly erected. Absolutely guaranteed.

Saves architect's, contractor's, lumber dealer's and jobber's superfluous profits. Cost of manufacture and erection cut in half.

It Will Pay you to Investigate.

Address

QUICKBILT Bungalow Department F118

A. C. Tuxbury Lumber Co., Charleston, S. C.

Built by ABERTHAW

TO have built a thousand things and built them well is to have gained wisdom.

The owner who relies on ABERTHAW to do his building is able to satisfy his particular want in terms of a generation's experience, reinforced by a modern organization that insures satisfactory accomplishment by unremitting supervision.

ABERTHAW CONSTRUCTION COMPANY

BOSTON ATLANTA BUFFALO PHILADELPHIA

6-107

The Favorite Flooring for Modern Textile Mills,
(—and Some of the Good Reasons.)

TUPELO

"Tupelo works easy and wears hard." *Most Economical Flooring for Textile Mills*

"WELL, THERE'S SOMETHING IN THAT."

TUPELO
("THE HARD-WEAR")
LUMBER

It is peculiarly valuable for TEXTILE MILL FLOORS, because, although it is a soft wood and therefore easily worked and laid, it has what scientists call an "involved" grain. This is a grain in which the fibres are "knitted" or "woven" together and results in extreme resistance to friction such as a floor has to withstand. TUPELO FLOORING DOES NOT TEND TO SPLINTER OR SLIVER. ("There's something in that.") This tough, wear-resisting characteristic of TUPELO is so great that this wood is largely used for FLOORING IN WAREHOUSES and for PLATFORMS WHERE HEAVY TRUCKING IS DONE. There is no harder test for a floor than that.

YOU WILL FIND IT ***WORTH WHILE*** *TO KNOW ALL ABOUT* ***TUPELO*** *BEFORE YOU PLACE YOUR ORDER FOR* ***FLOORING***

Ask us for Full Information about this valuable, dependable and, in the best sense, economical wood. Please address nearest office.

Southern Cypress Mfrs.' Association

805 PERDIDO BANK BLDG., NEW ORLEANS, LA., or 805 HEARD NATIONAL BANK BLDG., JACKSONVILLE, FLA.

ATLANTA—

Information Headquarters for Lupton Steel Sash Products

WIDER buildings—more floors—more intensive use of space: these are the tendencies of today in mill and factory design. And with them comes the need of steel sash, with its better daylighting and ventilation, in order to realize the full possibilities of modern buildings.

But the right ways of using steel sash are less familiar. There are several types, each with its own special advantages, and each with its own methods of erection, attachment and operation.

To help you to get full value from the daylighting and ventilating possibilities of Lupton Steel Sash Products, we have opened a direct sales and engineering office in Atlanta, in charge of two graduates of the Lupton Engineering Department.

These young men are not just salesmen. They are service men — trained engineers — who know every angle of Lupton Sash Products and how to use them. They can analyze your conditions, discuss your new plant over the drafting-board and tell you how to select and install suitable steel sash for your needs and what it will cost.

Just drop a line to David Lupton's Sons Company, 1024-5 Candler Bldg., Atlanta, and they will be glad to write or call in person.

Lupton Pivoted Factory Sash—*Cat. 10-LSS*

Lupton Counterbalanced Sash—*Cat. LCB*

Lupton Steel Partitions and Doors—*Cat. 10-LSP*

Lupton Rolled Steel Skylight—*Cat. 10-Misc.*

Pond Continuous Sash, for Pond Truss roofs, monitors, sawtooths, and side walls—*Cat. 10-PCS*

Pond Operating Device for long lines of sash—*Cat. 10-PCS*

"Today —— the Sash makes the Factory"

DAVID LUPTON,S SON'S COMPANY

Established 1871

Amber St. and Allegheny Ave. Philadelphia
1024-5 Candler Building Atlanta

Makers of Steel Sash Products for Industrial Buildings and Offices

Specialists in daylighting and ventilating equipment for maximum production

Canadian Manufacturers: The A. B. Ormsby Co., Ltd., Toronto

Lupton

INVESTMENT VALUE

THE FUNCTIONS OF THE ENGINEER

To Decrease the Cost of Production

No. 2—THE POWER PLANT

The fuel situation has combined with a competitive market to stimulate the thoughtful manufacturer's interest in his power plant.

The keen competition of present conditions lays stress on the need for greater operating economies.

The power plant is a field that has been only too frequently overlooked, in spite of its offering unusual possibilities for securing real economies—often with less change of equipment than would secure a smaller saving elsewhere in the factory or mill.

Perhaps one reason for this frequent neglect of so big an opportunity for economy, is due to the fact that the operations of heat, steam or electricity in the power plant are invisible and have always been a half-mysterious performance to the layman and the average executive.

But the operation of the power plant can be reduced to common sense figures measurable in dollars and cents by the Engineer.

These things, together with other phases of industry, are discussed briefly in two booklets for distribution, "Picks to the Minute" (about Textile plants) and "Factories for the Future," but we shall be glad to have you take up with us your problems for further discussion.

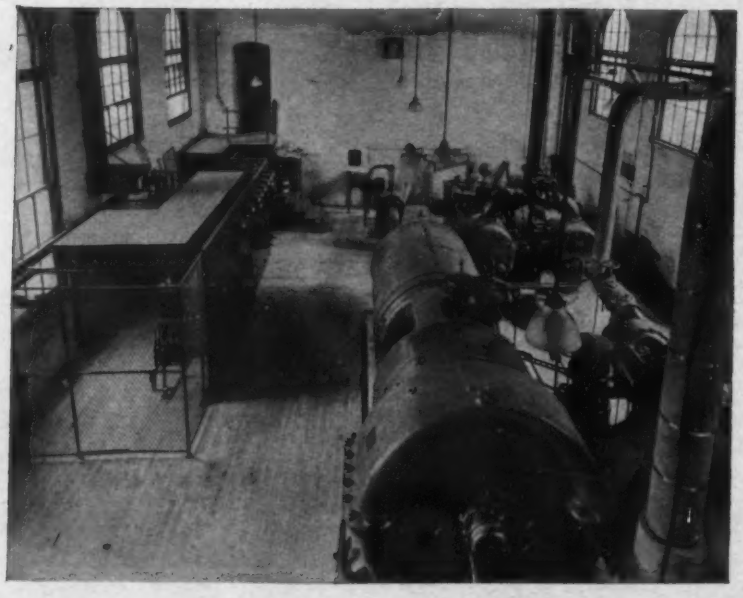
J. E. SIRRINE & COMPANY

Engineers

GREENVILLE
SOUTH CAROLINA

331 Madison Avenue
NEW YORK CITY

S
SERVICE



MILL WHITE PAINT
For Progressive Mills

Mill White will not yellow, flake off, or collect dirt. It may be washed like tile and withstands the vibration of the heaviest machinery.

Three Finishes
Flat, Eggshell and Gloss

Can be brushed or sprayed.

Manufactured by
The Patterson-Sargent Company
New York Cleveland Chicago St. Paul Kansas City

The Tropical Paint & Oil Co. has "Made Good" with Borden

Even as a child you knew of the Borden Co. and the high quality of its product—Eagle Brand Milk.

It was in 1910 that the Borden Co. placed its first order for Tropical Paint and Oil Company products.

And Tropical made good!

Since then the Borden Co. has re-ordered every year. Today sixteen of our different products have been used in nearly thirty of its branches.

For many years we've specialized in paints for industrial use. We've perfected formulae for every surface and condition. We've made Tropical the standard for good protective and decorative coatings.

One of our representatives will be glad to call at your convenience and suggest the most practical and economical coating for your requirements. Have your secretary write your name and address on this ad.

THE TROPICAL PAINT & OIL CO., CLEVELAND, O.

TROPICAL

Paints—Enamels—Roofing Materials

John W. Ferguson Company

AND Manhattan SHIRTS

Eleven contracts, totalling 119,446 square feet of floor space, have been placed with Ferguson by the Manhattan Shirt Company of Passaic, N. J.

Manhattan Shirts are but one of the many nationally-known products whose manufacturers turn to Ferguson whenever they have need of building.

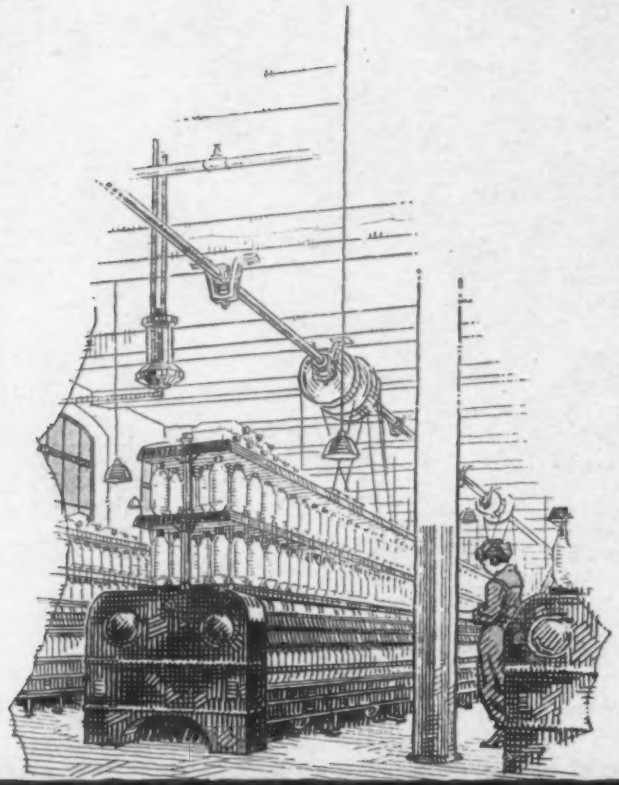
By actual count, 80 Ferguson clients have placed 395 contracts with this organization—conclusive evidence that they believe in Ferguson methods.

John W. **Ferguson** *Company*
Paterson, New Jersey

65-111

JOHN W. FERGUSON COMPANY

OJACO
MILL·WHITE



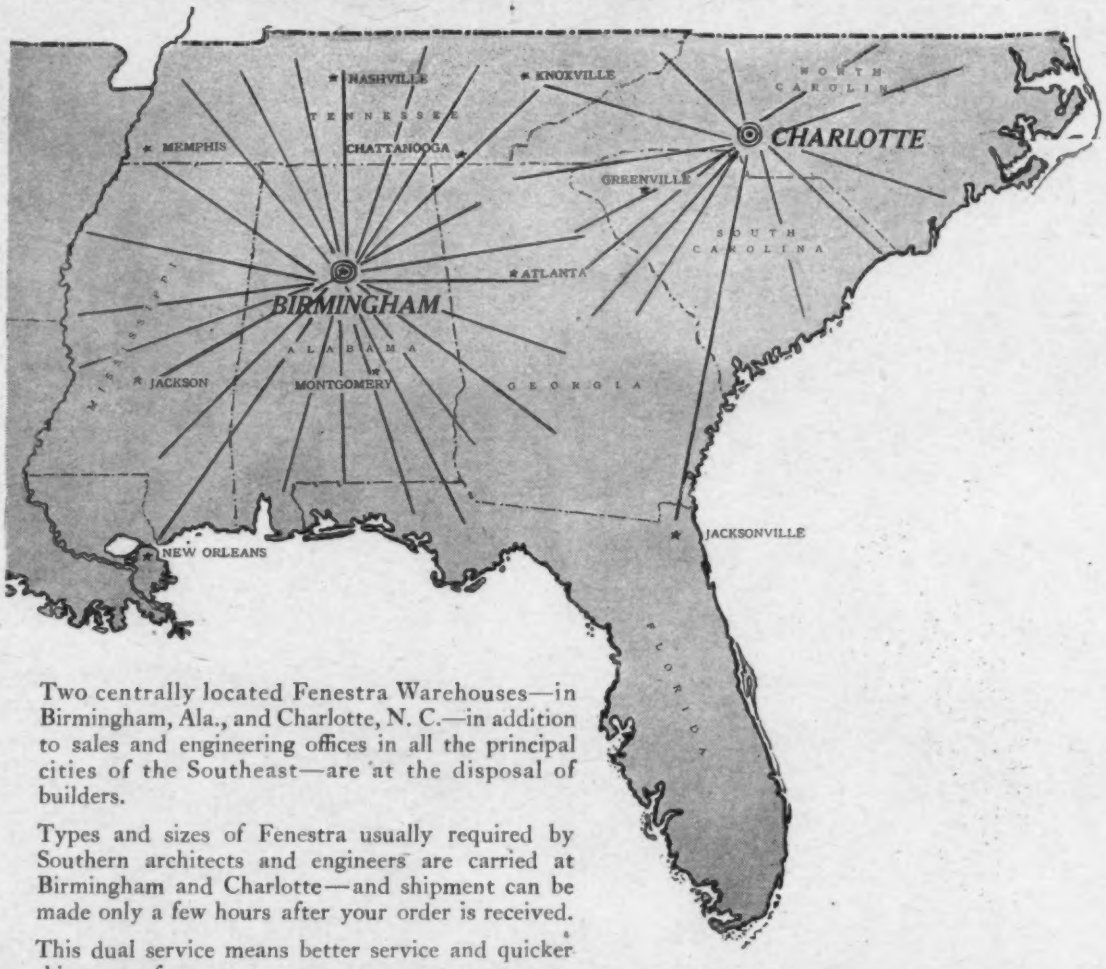
IN the spinning room, where thosuands of intricate machinery parts function at high speed, light, properly diffused and distributed, is a vitally important factor in quality and quantity of production.

Your lighting cost will be lower—your product better—your workers more efficient—if your walls and ceilings are coated with OJACO Mill White. It is first assistant to daylight. Try it.

OLIVER JOHNSON & CO., Inc.,
Paint Makers
Providence, R. I.

DISTRIBUTORS: Cowles & Bleckley, Atlanta, Ga.; Charlotte Supply Co., Charlotte, N. C.; B. A. Cook & Co., Fitchburg, Mass.; J. B. Farnum Co., Woonsocket, R. I.; Alexander Grant's Sons Co., Syracuse, N. Y.; Wm. F. Harticon, Fall River, Mass.; Lewis E. Tracy Co., Boston, Mass.; F. P. Van Hosen Co., Rochester, N. Y.; M. F. Bragdon Paint Co., Portland, Me.; Dwelle-Kaiser Co., Buffalo, N. Y.; Finney & Fuller Co., Inc., Utica, N. Y.

Take Advantage of Our Southeastern Warehouses



Two centrally located Fenestra Warehouses—in Birmingham, Ala., and Charlotte, N. C.—in addition to sales and engineering offices in all the principal cities of the Southeast—are at the disposal of builders.

Types and sizes of Fenestra usually required by Southern architects and engineers are carried at Birmingham and Charlotte—and shipment can be made only a few hours after your order is received.

This dual service means better service and quicker shipment—for you.

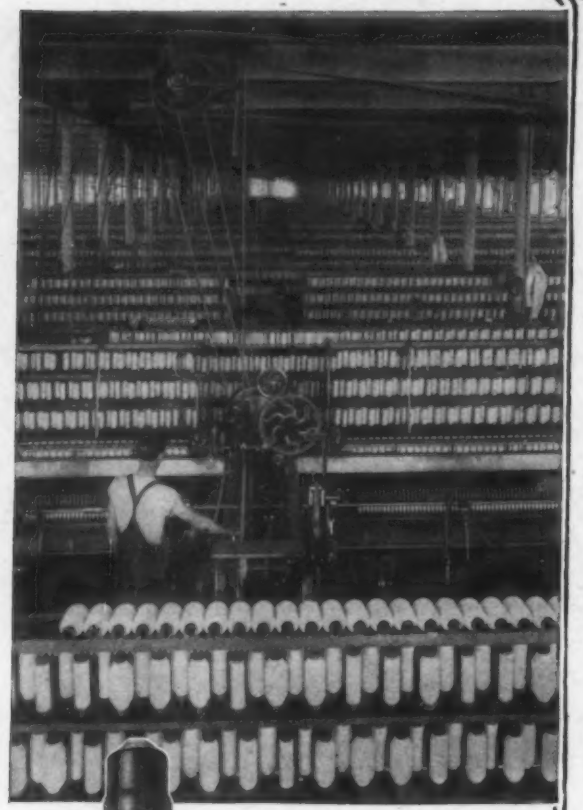
Take advantage of it—when you require quick shipment of steel sash.

Detroit Steel Products Company
4444 East Grand Boulevard, Detroit, Michigan

BIRMINGHAM WAREHOUSE
Detroit Steel Products Company
Southern District Office
BIRMINGHAM, ALABAMA

CHARLOTTE WAREHOUSE
Southern Engineering Company
501 Realty Building
CHARLOTTE, NORTH CAROLINA

Fenestra
STEEL WINDOWALLS



The Benjamin Deep Bowl Reflector With Guard

A lighting unit especially designed for use in textile mills and Storage Warehouses.

Combine SAFETY With Correct Light Distribution

Any matter involving safety is worthy of the deepest consideration. Too often a danger that may be regarded as remote in possibility is disregarded until it becomes a terrible actuality.

In the Benjamin Deep Bowl Reflector with Glass Guard we have forestalled the possibility of lint particles or other inflammable material coming in contact with the hot surface of a high intensity lamp.

This fixture shown is a combination of special wire glass guard and a 9-inch Benjamin Deep Bowl Reflector. It prevents damage to the lamp from without. If the lamp should break from other causes the guard prevents pieces of glass from falling down into the work, while if the guard becomes damaged the wire mesh will hold the broken pieces in place.

Wherever inflammable or delicate materials are being made or stored, protection like that afforded by the Benjamin Lighting Unit X6168G is an indispensable factor of safety.

For details write, the Advertising Department
806 W. Washington Blvd., Chicago

BENJAMIN ELECTRIC MFG. CO.

Factories: Chicago and Desplaines, Ill.

Sales and Distribution Offices:

247 W. 17th St., New York 806 W. Washington Blvd., Chicago
580-582 Howard St., San Francisco
Benjamin Electric Mfg. Co. of Canada, Ltd.
Toronto, Canada
The Benjamin Electric, Limited
London, England

BENJAMIN PRODUCTS

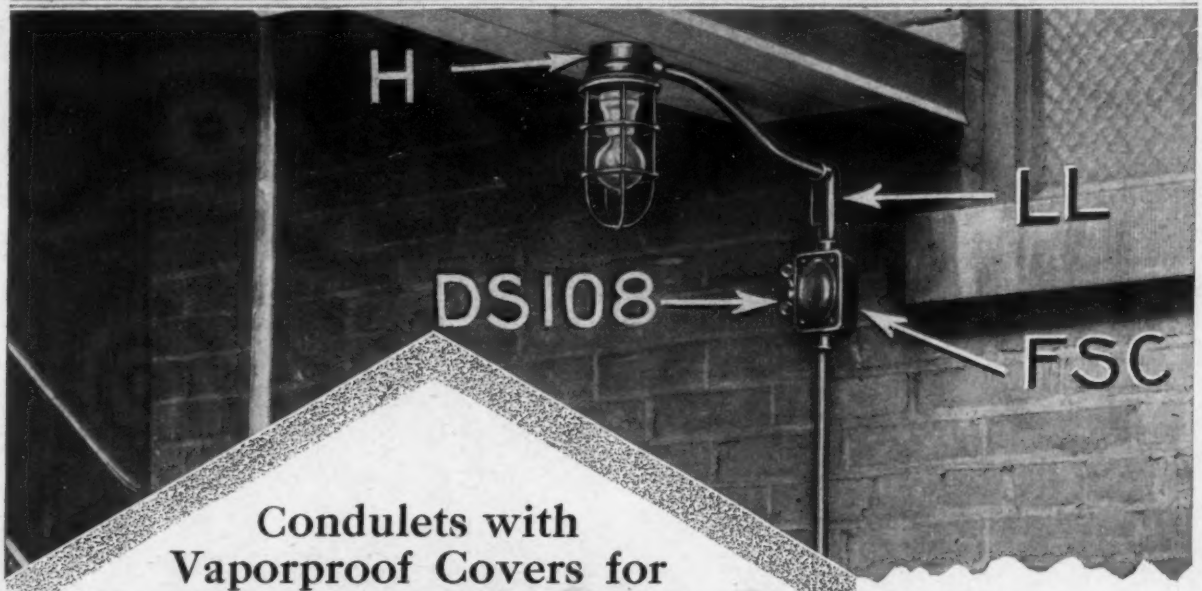
The following are divisions of Benjamin products on which we will be glad to send information:

Industrial Lighting Division
Electrical Division (including Benjamin Two-Way Plug)
Pressed Steel Products Division
Enameled Products Division
Starrett Panel Board Division

BENJAMIN

Makers of Things More Useful

CONDULETS

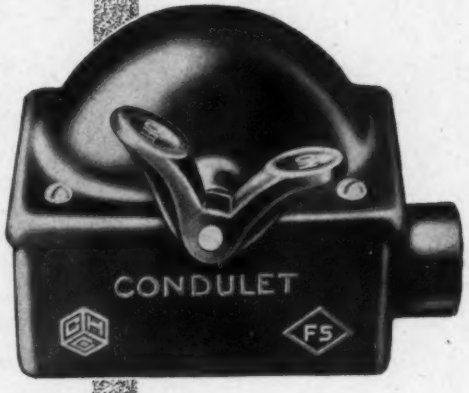


Condulets with Vaporproof Covers for Push Button Switches

THE combination of FS Condulet with DS 108 cover makes a substantial vapor, gas, dust, and water-tight enclosure for push button switches.

A rubber gasket effectually seals the joint between the body and cover. The hole for the shaft is a tight fit and sealed with grease which prevents corrosion and entrance of moisture at this point. These Condulets and covers make possible the use of push button switches in oil houses, garages, refineries, flour mills, bakeries, munition factories, grain houses, cleaning establishments, docks and boats, under conditions where heretofore the use of these switches has been considered impractical and in fact wherever an open arc would be dangerous or the atmosphere harmful to the switch mechanism.

Send for Condulet Catalog.



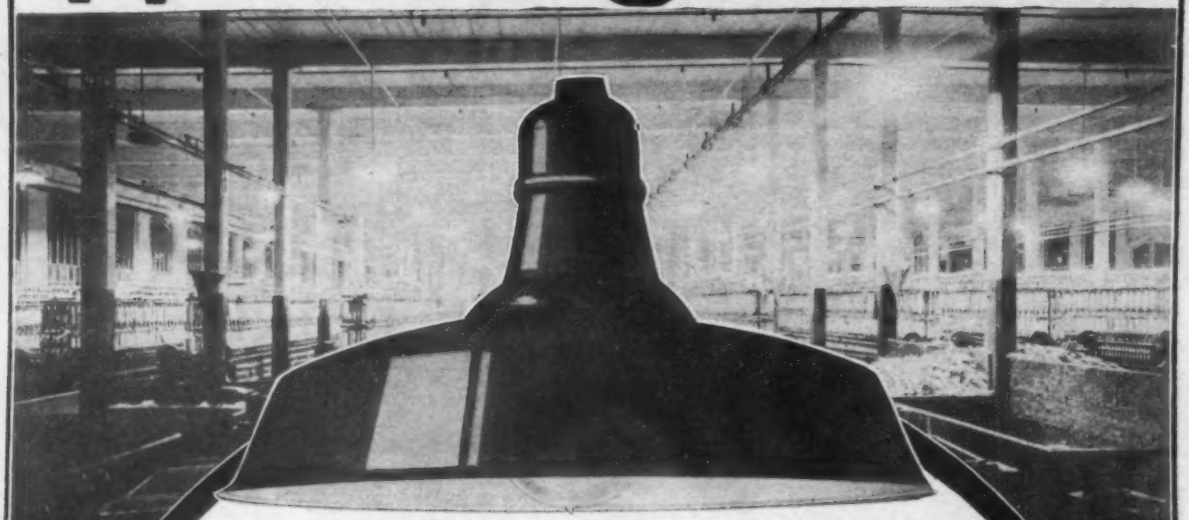
FS CONDULETS
The operating handle is marked so as to indicate when switch is "on" or "off."

CROUSE-HINDS COMPANY
SYRACUSE, N. Y.
BOSTON NEW YORK CHICAGO
Condulets Panelboards
Knife Switches Floodlights
Guy Anchors
1613

Condulet the Job

CROUSE-HINDS

Westinghouse



Reflections
from
Cutter Reflectors
equipped with
Westinghouse Mazda Lamps

Easy to Wire—Only a few operations are necessary. One complete fixture can be installed by one man in 3 minutes.

Interchangeable—Reflectors of different sizes and different types may be substituted at any time.

Water-Proof—Reflectors are specially designed to effectively protect the fixtures under the most severe atmospheric conditions.

No Short Circuits—Reflectors are insulated from the conduit, and the terminals are protected from accidental short circuits.

Proper Light Distribution—Reflectors are held in correct position with respect to the lamp filament, obtaining that distribution of light for which they are intended.

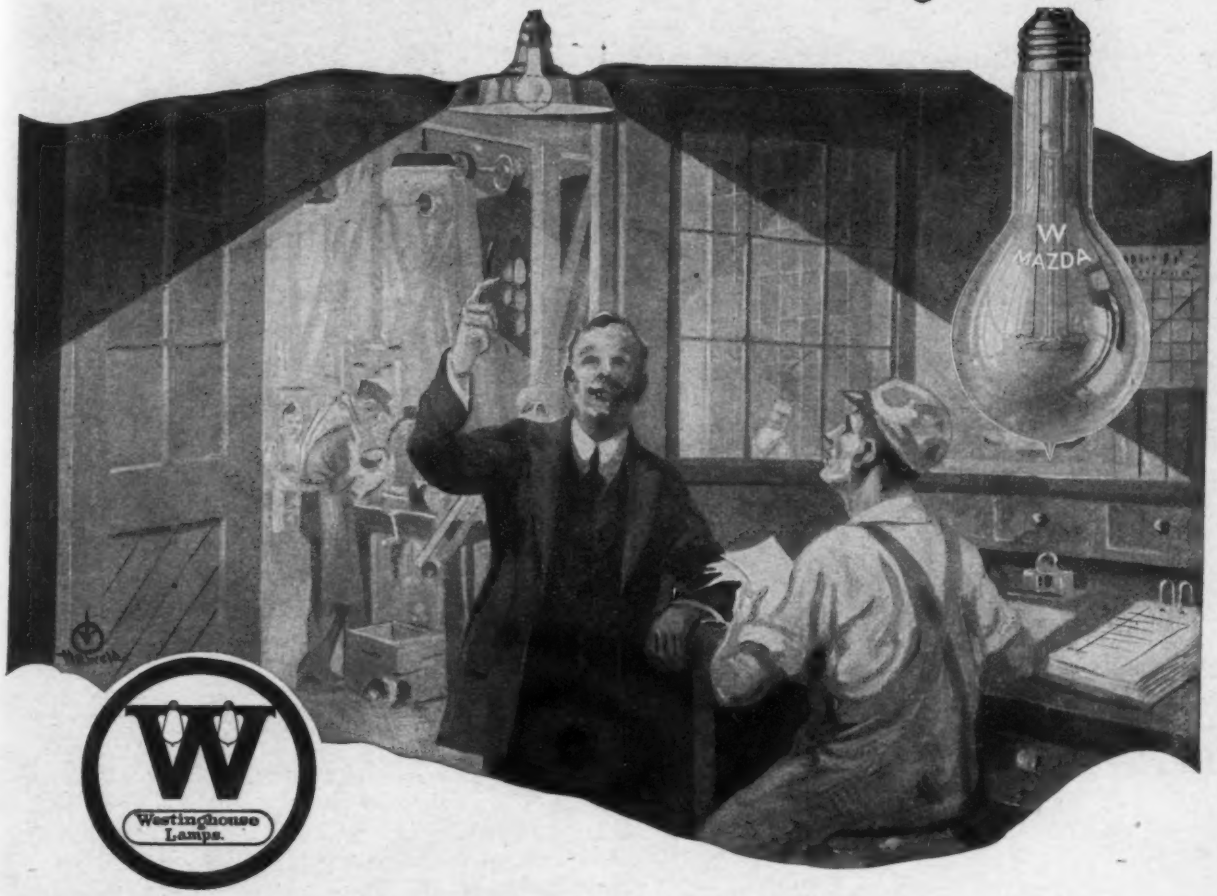
Our Illuminating Engineers will gladly cooperate with you in solving your lighting problems.

Write to the nearest Westinghouse district office.

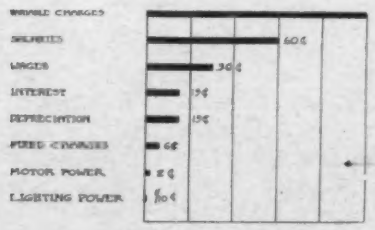
Westinghouse Electric & Mfg. Co.
George Cutter Works
South Bend, Indiana.

W
WESTINGHOUSE ELECTRIC

"Sam, How much does it cost us for this Improved Lighting?"



"Why, Chief, that's just what I'm working on. The Cost Department gave me some figures and here's the chart we've plotted."



CHARGES PER HOUR AGAINST A MACHINE TOOL

"Do you mean to say that our lighting only costs us a tenth of a cent for each machine tool?"

"Yes sir."

"That includes the lamps and shades, I suppose?"

"Not shades, Chief — 'Reflectors' — 'Cutter R L M Reflectors'—Yes sir, it covers everything."

"I wonder if other factories get these same costs on lighting?"

"It depends upon the kind of work, Chief, but they can learn if they'll write the

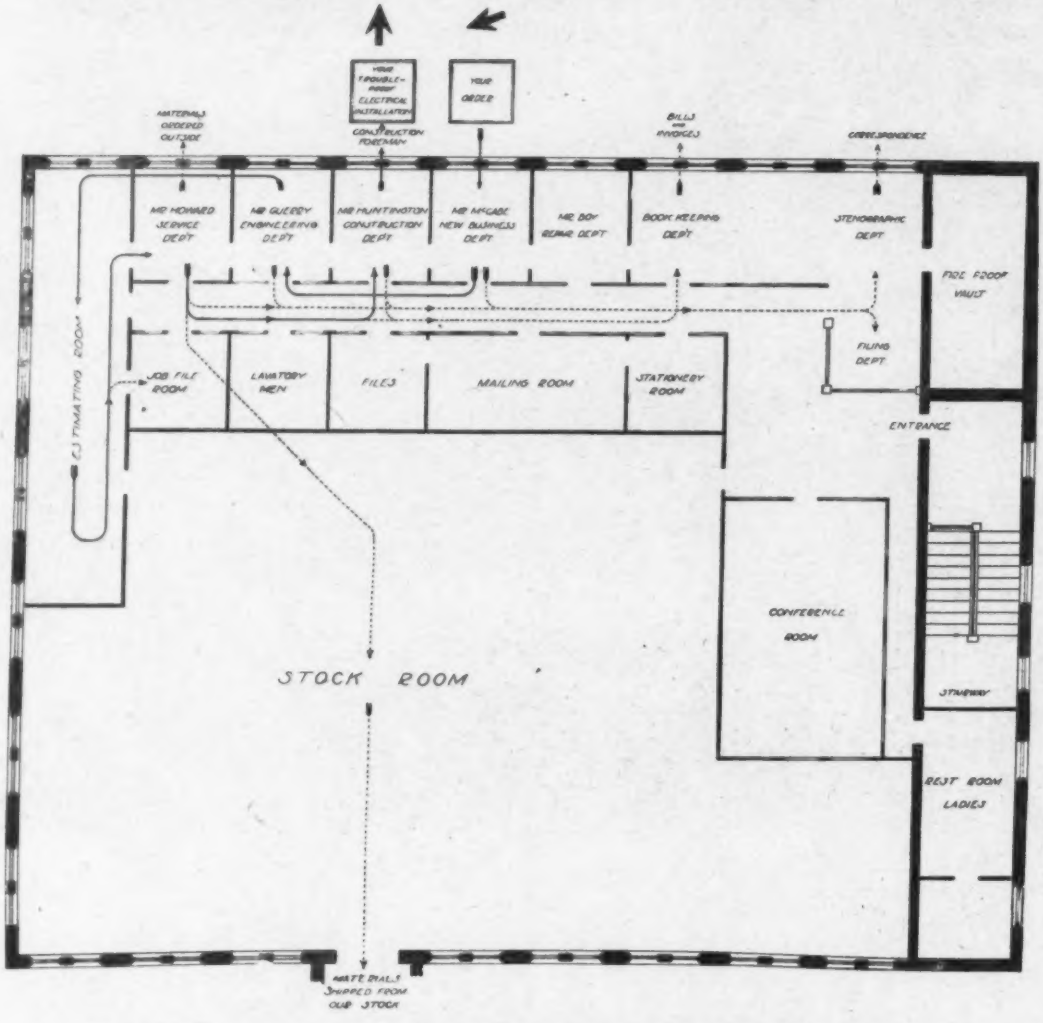
WESTINGHOUSE LAMP COMPANY

165 BROADWAY NEW YORK, N. Y.

Sales Offices and Warehouses Throughout the Country

For Canada—Canadian Westinghouse Co., Limited, Hamilton, Ontario

Follow Your Order Through!



This Diagram of the Second Floor of Our Building Shows

THE ORGANIZATION
BEHIND

Huntington & Guerry "Trouble Proof"
Electrical Installations for Industrial Plants

A PLANT—AN ORGANIZATION—A STOCK
AT YOUR COMMAND
FOR BETTER ELECTRICAL INSTALLATION SERVICE

Greenville, South Carolina

Night View of Crompton Mills, Crompton, R. I.

Cooper Hewitt Light Lessens Labor Turnover

Up at Crompton, R. I., the oldest corduroy mill in the country has been modernized with Cooper Hewitt light. This mill is one of but a few American Mills able to meet foreign competition in this line—and it does so by means of double shifts made possible by Cooper Hewitt Light.

Just one example of how Cooper Hewitt Light has affected the labor turnover: In the basement weave shed the workers are dependent entirely on artificial lighting. Under old conditions the labor turnover was 100% every three weeks. Under Cooper Hewitt light, it has been cut down practically to nothing and operators on other floors have asked to be transferred to the basement because of the restful light and cooler temperature!

In other Cooper Hewitt lighted departments of this same mill, the second shift (from 2 P.M. to 11:37 P.M.) shows 2% higher production, with fewer "seconds," than the first shift (from 6 A.M. to 2 P.M.).

Our lighting specialists are at *your* service.

Cooper Hewitt Electric Company

Boston—161 Summer Street
Chicago—618-9 Fisher Building
Cincinnati—First National Bank Bldg.
Cleveland—Engineers' Building
Detroit—Ford Building
Hoboken—95 River Street

Hoboken New Jersey

BETTER THAN COOPER HEWITT LIGHT INCREASES PRODUCTION DAYLIGHT

Los Angeles—Keese Engineering Corp.
Milwaukee—Security Building
Philadelphia—Drexel Building
Pittsburgh—Westinghouse Building
St. Louis—Title Guaranty Bldg.
Syracuse—University Building

CH-29

"NATIONAL DYES ARE NATIONAL ASSETS"

NATIONAL U.S.A. DYES

"NATIONAL" INDIGO 20% PASTE

SOUTHERN Textile Mills will be interested in the announcement that we are prepared to make immediate deliveries of NATIONAL INDIGO 20% PASTE from our Charlotte Branch.

¶ With indigo specialists and modern laboratory facilities, we are equipped to render technical assistance to those who may need such cooperation.

¶ Careful, painstaking effort on the part of trained, technical men, together with large and well equipped manufacturing plants, go far to explain the high standard of NATIONAL QUALITY.

National Aniline and Chemical Co. Inc.

General Offices

21 Burling Slip **New York**

Southern Office

236 West First Street, Charlotte, N. C.

QUALITY

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 85 **Member Audit Bureau of Circulation.** **No. 3**

This Issue 6,500 Copies.

CONTENTS

EDITORIAL—

One Fact in a Fog of Language....155
Chickens Come Home to Roost....156
The Year in the Cloth Market....157
The Carders' Sectional Meeting....158

GENERAL AND TECHNICAL—

Morale—The Secret of Industrial Success....159
A Practical Gear Room....163
Cloth Costing and Production....165
Standardizing Motor Applications....169
Carders Discuss Practical Problems....170
Southern Mill Construction and Additions in 1920..175
Printing the Sulphide Colors....193
Cotton in the Far Eastern Market....197
What the Southern Mills Are Doing....199
New England Mill Situation....200
Cotton Comment....201
In the Chemical Market....203
Notes About Men You Know....204

HOW OTHER MEN MANAGE—

A Safety Device for Hard Ends....207
Settings, Drafts and Twist....207
Favors Two Processes of Drawing....208
What Settings Would You Use?....209
An Experience With Hard Water....211
Accelerate Textile Inventions....211
A Shop Conference on Supplies....215
Plant Government....215
Practical Carding Advice....219
Further Details in a Mill Experience....219
A Wartime Experience....220
Another Mill Experience....221
Notes About Men You Know....223
Machine Guards and Workmen's Compensation....225
Water—Its Uses in the Textile Industry....227

KNITTING SECTION—

The Year in Knit Goods....233
Knitters Convene at Chicago....235
The Knit Goods Market....239
The Yarn Market....245
Among the Knitting Mills....248

Converse & Co.

SELLING AGENTS

For over half a century this firm has maintained a steady, conservative growth, but in recent years it has taken the lead as one of the largest distributors of cotton fabrics.

The already broad scope of its resources has recently been augmented by the addition of the B. B. and R. Knight Mills. Today it has exclusive sales agencies covering the product of more than 1,000,000 spindles and 25,000 looms.

In addition to many offices in the principal cities of this country, its export department maintains well organized branches and agencies in all the leading world markets.

Its service is a practical force at work every day.

88 WORTH STREET
NEW YORK CITY

With the Publishers—

H. P. WEAVER.

Building Morale.

The confidence of workmen in the man for whom they work, the spirit of cooperation with each other and their immediate superiors, and the feeling of personal interest in the progress and success of the organization of which they are a part are prime factors in the industrial success of any corporation or institution. These factors cannot be bought and paid for with wages. They constitute morale and morale must be built carefully and gradually.

H. P. Weaver, author of the article "Morale—The Secret of Industrial Success" to be found upon another page, graduated from Lewis Institute in Chicago in 1905, with the degree of Mechanical Engineer. For two years he was connected with the Traction Company in Chicago in the office of the chief engineer. In 1907 he became associated with the Independence Bureau of Philadelphia, a firm of consulting engineers established in 1903. Mr. Weaver is now General Manager of this organization.

One of the important activities of the Independence Bureau has been the study of industrial relations, or factors bearing upon the relation between the management and the men. The first tendency of industrial engineers was to limit their view of industrial relations to a study of labor turnover and the technique of employment. The Independence Bureau, however, soon found that the field was not subject to any such limitations. The trails soon led not only into unexpected developments within the organization being studied, but also led outside the plant fence. Within the organization it was found necessary to study not alone the workers and those immediately in contact with them, but also to devote time and study to the executive heads of the organization. The character of an organization, including the breadth of vision of the executives and the methods for carrying executive direction throughout the organization is perhaps of more importance than any other factor in producing the best spirit in an organization. This subject of morale is the theme of Mr. Weaver's article in this number of COTTON.

Why Not Aid the Other Man?

A large part of the selling troubles of textile mills is caused by the lack of system of some competitor who quotes a price below the actual cost of production on some style, and does it in the honest belief that he is making a profit. Unfortunately, such a man not only injures his own business, but he also disorganizes the whole textile market.

James Ward, in his article on "Cloth Costing and Production" on another page of this number, discusses in a practical way some of these factors in cotton manufacturing and includes the following suggestion:

"Much good would be accomplished if manufacturers, at their usual meetings, would discuss such subjects as production, waste, power costs, etc. It would give an exchange of ideas, make for the stability of the trade. Or, each manufacturers' association could compile for guidance a minimum basis of costs for the different classes of goods, subject to variations, with allowance for waste, discounts, etc., and containing general provisions and definitions. Such a table would, I believe, serve to eliminate a lot of reckless quotations."

The National Association of Hosiery and Underwear Manufacturers already have some such effort outlined that is intended to attain a similar end. This suggestion as well as others advanced by Mr. Ward in his article, should be given careful consideration. It is one of those incidents that, sometimes forcefully, call our attention to the well known fact that it usually pays to cooperate with the other fellow—to lend a hand and not attempt to isolate ourselves, making of our mill a castle.

Tacking to Windward.

The ship of business has sailed before the wind for a considerable period. Toward the last of the blow it seemed almost necessary to reduce sail and during recent months it became so squally that reduction was imperative. Now the worst of the storm is over, the desire to reach the safe port from whence he started is uppermost in the mind of each mill "skipper" and with his business ship "close-hauled," he is "tacking" to windward.

Running close-hauled in the mill, as in the nautical sense, means taking advantage of every legitimate means to "trim" the business ship and keep it headed close into the wind; to save time and material; to secure the same or a greater production at a less cost per pound. In this work the Editorial Department of COTTON is lending material aid.

Some very practical suggestions were printed in foregoing numbers and we are advised that others are to follow. An example of this type of article is the description of the practical gear room by Mr. Finnetney which appears on another page. Another is the safety device for hard ends which will be found in the department entitled "How Other Men Manage." These are but two of the many good things in this number. Look it over carefully and then write to the Editors and tell them about something you are doing in your mill that helps you to reduce the manufacturing costs per pound—that helps you "tack" to windward.

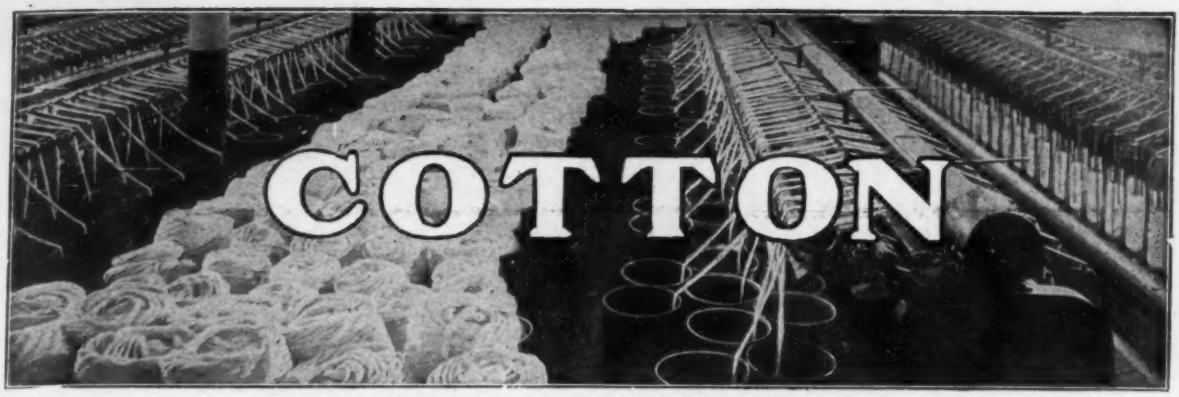
AMONG COTTON'S READERS

Allen F. Johnson

President American Cotton Manufacturers Association.
Vice-President Consolidated Textile Corporation.

"I have watched with much interest the growth and development of COTTON***. I look forward to each issue and commend it to all who have a direct or indirect interest in the staple."

Allen F. Johnson



January, Nineteen-Twenty-One

One Fact in a Fog of Language.

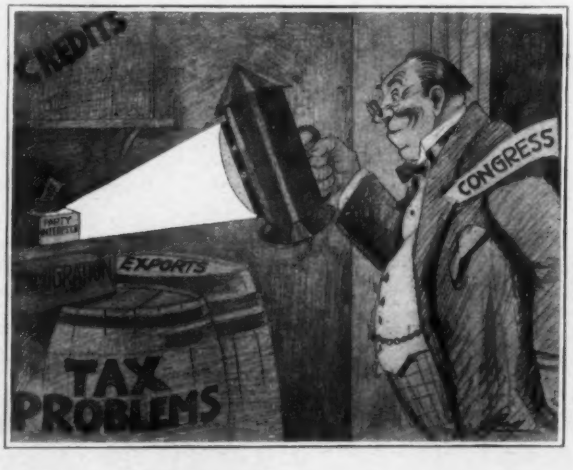
The effect of a month's discussion at Washington has been to shed a lot of language and mighty little light on the future of the nation's tax problems. There have been long columns of interviews, of testimony, of reports, of appeals for more money, of pronunciamentos for economy, and of general dissertations on the ebbing tax resources of the United States. But they have only emphasized the fact that even the Republican leaders who have taken charge of the country's tax reform have not been able to agree on the fundamental details of their task. The Democratic leaders in Congress have made no effort to interfere with the hopes of the Republicans that they will yet be able to find a basis for successful procedure. Secretary Houston, in his annual report, outlined the Treasury views on taxation problems, and the Republican leaders have been willing to listen to his experts. They have, however, shown little inclination to adopt the suggestions of these experts. Naturally the Congressional leaders will wait until President Harding has taken the oath of office and has seated a Republican successor at Mr. Houston's desk.

Although the Washington dispatches continue to confine themselves chiefly to problems of revenue and taxation, it is interesting to note that all the conversation behind the Front Porch at Marion centers on foreign problems. From this it would seem that President Harding will leave most of the constructive revenue work to Congress and busy himself, at first anyway, with an attempt to straighten out the tangled skein of our foreign affairs.

In the fog of language that has shrouded Washington's struggle with revenue problems, there looms just one significant fact; if there is to be relief for the impatient taxpayer, it will have to come from government economy rather than from a clever juggling of taxation forms. Thrift means the elimination of useless spending just as much in government as it does in private affairs. All the taxation schemes in the world, direct and indirect, cannot prevent a Treasury deficit if the government officials shovel out the dollars faster than they come in. It is merely a financial application of the motto that decorates the Fiji Island Finishing School for Girls:

"You cannot eat your husband and have him too!"

No treasury can long endure with "everything a-going out and nothing coming in." So far there has been no indication that the spenders of the nation's tax income are at all willing to retrench. The estimates which Secretary Houston submitted to Congress call for $4,653,856,759. For the current year Congress appropriated $3,717,441,484 and Congressional leaders declare that they will not allow a larger expenditure in the coming fiscal year which ends July 1, 1921, than for the current year. For that reason they have been busy during the past three weeks carving out juicy portions from the various appropriation bills submitted by the departmental experts. Whether they will be able to economize enough to make a radical revision of the tax laws possible is, of course, another question. There certainly are enough opportunities for deep and abiding incisions into departmental demands. But from past performances, there is the usual danger that the Congressional ideas of economy will be applied most radically to the work of Government agencies which have a genuine productive value, and that the need of saving money will be most leniently applied when it comes to expenditures that have a definite value as political patronage. With all the promises of a restoration of businesslike government, Republicans are just as human as Democrats, and the nation should not be disappointed if the spending of Uncle Sam's money continues to be governed by tenets of political economy that are not essentially unselfish.



Nor is it wise to put too

great faith in the efficiency of the budget system. No method can be more wasteful than the unsystematized program which has led to extravagance in the past. All the budget can do will be to put system into the Government appropriations and to center the responsibilities that go with them. This centering of responsibilities will, of course, carry with it a curtailment of the more grievous abuses, but those who think that the days of the pork barrel appropriations are forever past, seem likely to be disappointed. Future pork-barrel bills may be more scientifically constructed, but the scent of the pork will cling to them still.

One definite forward step has been taken in the determination of Congress to work out a reclassification of government bureaus. This is a natural corollary to the budget plan. The latter is designed to work out a systematic scheme of government appropriations.

The reclassification program calls for a systematic scheme of government administration. It is but natural that in a government machine which has grown like that at Washington, abuses should creep in. Many expensive fields of government endeavor are covered by a multiplicity of overlapping departments and bureaus. This is the result of unscientific legislative planning. Congress created an ever-increasing list of agencies to do some particular task which seemed necessary for the public welfare or valuable for political purposes. Usually this was done without much effort to find out whether it conflicted with some existing agency, or whether the work was already being done by other governmental bureaus. These in turn attempted to extend their fields with a similar disregard of the work that was already being done, and then relied upon Congressional influence to keep their extended bureaus at work at government expense.

Some of these items of duplication make it easy to understand why the late Senator Aldrich declared that a private corporation could save a billion dollars a year in government expenses. The debates which took place on the passage of the reclassification bill brought to light striking instances of these expensive duplications.

Forty government agencies, for instance, were spending government money on items that concerned public health. All of this work, of course, was not duplicated, but a coordination of their efforts would have saved millions of dollars and in the end have given to the nation a far more valuable public health service.

Nine departments, including 34 bureaus and 4 independent agencies are spending something like $500,000,000 on engineering projects. Again, it would be folly to assert that all of this is duplication, but there is no doubt that a vast sum is wasted, and that in some cases there is a direct hindrance in the friction that must result. Certainly economy is not possible under such conditions. No private corporation would attempt efficient work in such a way. Waste is inevitable. The inefficiency that must grow out of these conflicting lines is reflected back to the whole machinery of the Government.

It is a long way, however, from Congressional discussion to actual economy. This is not the first time that a call for reclassification of the government bureaus has been heard. It is easy to talk about the elimination of duplicating agencies. In a private business it is not difficult to carry out such elimination. In the Government it is different. Even when there is a change of the party in power, it is surprising to discover how tenacious is the hold upon the appropriation bills, and how difficult to pry it loose.

Chickens Come Home to Roost.

A plan to establish a basis of economic independence for the southern cotton grower was carefully outlined, and steps were taken to form a south-wide organization to carry it out, at the recent cotton convention called by the Memphis Chamber of Commerce, the Memphis Cotton Exchange and the Memphis Clearing House Association. The plan consists of a reduction of acreage by cotton growers next year by one-third, and of yield by one-half.

The plan of organization will reach into every voting or school district through county executive and state central committees. The convention committee was constituted a temporary executive committee and $10,000 subscribed from the floor for preliminary work.

Compliance with the reduction plan is to be enforced through credit restrictions and by denial of credit to any planter, farmer, supply merchant or land owner who refuses to join in the movement. At the same time, a rational system of diversification, including live stock, food and feed crops, will be worked out.

A resolution was adopted, calling for the enactment by Congress of a law for a special census to determine how much untenderable cotton is now in domestic stocks; another requests land owners not to require fixed money or poundage of cotton for rentals; another favors a system of bonded warehouses, and a plan of cooperative marketing; and still another favors all safe and sound plans looking to the extension of long credits to foreign customers.

The foregoing paragraphs are from a news story sent out from Memphis and briefly outline the plans set forth in the formal report of the "Committee on Cotton Reduction." They are holding the "big stick" of denied credit over those who refuse to meet their demands. This is very plainly a combination in restraint of trade, but under the Sherman anti-trust law, modified by the Bartlett-Bacon bill, passed in the early days of 1914, they are doing nothing illegal. The bill reads: "* * * nor shall any arrangements, agreements or combinations be unlawful among persons engaged in horticulture or agriculture when made with the view of enhancing the price of agricultural or horticultural products; * * *."

Manufacturers are willing, nay, anxious, for the cotton grower to receive a fair price for his product, but no fair-minded man likes to see an unlimited power of control of a necessity like cotton placed in the hands of a few men to do with as they will.

Last year saw night riders burning gins in an effort to "control" the ginners. An unlawful action.

This year promises to see bankers starving clients in an effort to "control" the clients. Not an unlawful action.

Thus we may view the operation of a law which President Taft declared was "class legislation of the most vicious sort."

The new Administration will mean not only new political policies, but new business policies; and there has never been a time when the business policies of the Government were capable of working a greater influence on the business future.

The Year in The Cloth Markets.

In the records of cloth market history there is no parallel for the experiences of 1920. The inevitable after-war influences of extravagance and thriftlessness found expression in a demand that was irresistible to speculators and to many merchants who knew the penalty they must pay. The already broadened profit margins of 1919 were further expanded until prices became utterly unworkable in distributing channels. The break came with such overwhelming force that orderly and mercantile liquidation was impossible. In a single month, and that the eleventh of the year, values broke 25 per cent, after previous declines amounting to half the top prices asked in April.

The cancellation of orders by buyers was accepted as a necessity in many large houses. The huge citadel of profitable business, built up on the foundation of the automobile trade, collapsed like a house of cards. Mills began to close until as the year ended hardly 50 per cent of the capacity of cotton manufacturing in this country, or elsewhere, was active. From a condition of scarcity among workers, the year developed at the close, in mid-winter, a condition of unemployment not exceeded in cotton manufacturing centers by the panic experiences after 1873 or 1893. In the last quarter of the year, months after the mills had accepted huge paper losses, operatives were asked to accept wage reductions. These reductions totalled 22½ per cent at a time when manufacturers were unable to assure employees of work for more than half the normal working time.

There came upon the trade a belated recognition of a collapse in purchasing power among the masses of people, that has not even yet been properly measured, but has become of fearful proportions among cotton growers, wheat farmers, and other primary producers on whom basic wealth rests.

To the manufacturer and merchant the story of the year may be quickly told in a chart of high and low prices in staple cotton goods, unfinished, as follows:

Count, Width and Weight.	Dec. 24. Open'g	Dec. 24. High	Dec. 24. Low	Dec. 24. Close
64x60, 27 in., 7.60 yds...	14¼	16¾	5¾	5¾
56x52, 27 in., 9.00 yds...	13	15½	5	5
60x48, 38½ in., 6.25 yds.	18¾	24	6¾	7
64x60, 38½ in., 5.35 yds.	21¼	26	7½	8
68x72, 39 in., 4.75 yds...	25½	27½	8¾	9¼
72x76, 39 in., 4.25 yds...	26¼	30	10¼	10¼
80x80, 39 in., 4.00 yds...	32	33	10½	10½
80x88, 39 in., 5.00 yds...	37	39½	15	15½
48x48, 36 in., 4.00 yds...	23	25½	8¼	8¼
48x48, 31 in., 5.00 yds...	18½	20	6¾	6¾
48x40, 36 in., 5.50 yds...	16¼	18¾	6½	6¾
76x72, 40 in., 9.00 yds...	33	37	13½	13½
88x80, 40 in., 8.50 yds...	40	42	16	16
96x100, 40 in., 7.00 yds..	47	52½	18½	18½
88x80, 30 in., 11.35 yds..	24	30½	12½	13
Spot Cotton, N. Y.....	39.75	43.25	14.50	14.50

The international financial and political conditions are by far too complicated and uncertain to warrant many of the hopeful predictions that will be put forth at this time. The outstanding fact that merchants and manufacturers of long experience see is the huge debts of the world, that are as yet unpaid, and the mighty burden of taxation that must be borne until orderly payment is provided for. High prices based upon fictitious currency, and upon debts instead of assets, have passed away for a long time to come, and the immediate price dangers are those that will come from a hectic rise brought on by the restoration of demand to come as a consequence of the greatly curtailed production.

The world must get back to hard and steady work, to a condition of healthful economy in clothes, as in other things, and to a common realization that war time profits are fugitive profits, and cannot be made permanent at the expense of suffering and destruction. It is the opinion of the most conservative thinkers in the industry that the spring business will be very small and done without profit, the fall business, beginning possibly in June and July will be better, while for the longer future, opportunities for prosperity will increase in proportion to the zeal and contentment every man brings to his part of the world's work.

The cloth markets opened firm in January, and hesitated only as Wall Street showed signs of financial timidity. The automobile trades bought liberally, thus giving further incentive to the pernicious influence this trade exerted on cloths made for strictly clothing purposes. As the month closed, prices for domets for fall 1920 were advanced nearly double those of the preceding year. February was a quieter month, and was particularly characterized by a series of storms that paralyzed traffic throughout the northern section of the country, and led to immeasureable congestion on southern railroads and in southern ports. The experiences of that month led to a more sober conception of the future and it was reflected in the collapse of boom conditions in clothing linings and other things. Nevertheless, jobbers bought freely as the mass of people felt prosperous.

March was a month of rising prices, stimulated by a much touted scarcity resulting from irregular distribution, due in part to the great railroad and port congestion, but in a larger measure to the then unrecognized speculative withholding of merchandise from the markets, in warehouses, or elsewhere. There were some men who were sharp enough to see that a panic in the silk industry of Japan, beginning in February, and lapping over into March and the later months, was the sure forerunner of inevitable collapse. Credit had become exhausted although the cry of scarcity still resounded in mercantile channels.

April saw the top reached in most cotton goods prices. It was reflected in a price of 26 cents to 26½ cents for a common print cloth, that had sold for less than 4 cents before the war, and that sold for 7½ cents before the year ended. The rise of cotton above 40 cents a pound did not prove troublesome to mills as they had a profit margin in hand that could have stood 60 cents a pound if it had been imposed at that time. Some buyers actually made contracts for cloths at the top prices for deliveries extending through September and dress ginghams were lifted to levels above those named earlier in the year.

In May it was certain to financiers that the continued pressure of high money, restricted credits, weakening power to pay, marked the approaching end of wildly inflated prices and business. It was in that month that John Wanamaker, this country's most famous retail dry goods merchant, startled the world by announcing a 20 per cent reduction on all goods throughout his two great stores. There had been sporadic protests against high prices for cottons, among others an overall movement originating in the South, and old clothes movements publicly inaugurated elsewhere. These things all tended to show that consumers had reach-

ed the point where they could not or would not pay more. Jobbers and others issued optimistic circulars, but it was clear to experienced manufacturers that the end of the rise was sure.

In June the markets were quiet and forced offerings were not as numerous as in the month preceding. Prices were down about 7½ per cent from the top, only, and some things were done to continue prices on finished goods for the coming quarter. Wages were advanced 15 per cent, but it was felt then, as it has been since, that the last advance was unwarranted. It was impelled in part by the desire of manufacturers to fill the high priced orders on their books.

After the Fourth of July, trade did not revive as hoped for. The markets were weak and irregular. The leading producer of ginghams named prices on the January level to continue to December. Cancellations of orders were becoming very severe and liquidation was more general. Finishers began to report a distinct falling off in business and curtailment of operations became a little more general. Fine and fancy wash goods for spring were opened at 40 per cent above the prices of the preceding year but little or no buying followed. In August liquidation increased, the re-selling in second-hand markets being persistent. Curtailment in mill centers increased steadily. Bleached muslins were reduced 20 per cent and the prices guaranteed to October 15. All sorts of guarantees were offered in the hope of inducing further business but buyers held off. It was in this month that the collapse of the yarn markets really began and for three months thereafter, the downward slide was unlike anything previously known.

In September, unsettled conditions were very marked. Cotton fell rapidly, so that by the end of the month a spot price of 25½ cents prevailed as against 43¾ cents in the middle of July. The largest producer of dress ginghams cut prices 33⅓ per cent and the fact was wired all over the country and made much of in the daily press. In October, the steady declines continued, a 15 cent a yard reduction in bleached muslins being made when a new agent took charge of a leading brand. Jobbers held liquidation sales and mills began closing still more.

In November there was a ruthless marking down of prices. Percales had been cut 15 cents a yard in October, and a further cut of 1½ cents was made in November. Stock protection was abandoned by printers when narrow prints were reduced to 12½ cents from 23 cents. Denims were cut from 44 cents to 25 cents. Several lines of gray cloths dropped 25 per cent in the 30 days. The story of December is so recent that there is little to be added.

Some jobbers held conferences with selling agents and tried to make an agreement to revise prices on standard staple goods at once. Wide sheetings were reduced from 80 cents to 55 cents a yard, and in the latter part of the month other reductions were made, equally as startling. It was the final effort of agents to try and stabilize prices before January, 1921, opened. What the effect will be can only be surmised.

Stocks of standard staple goods are light, mills are carrying hardly a two months' output of all kinds of goods, and many buyers have purchased little or nothing for three or four months. The retailers have reduced prices severely in some cases, but the retail liquidation of prices is yet to come. If it stimulates buying, recovery will come quickly. If the public remains indifferent, the recovery will be slow and manufacturers will be prone to re-start mills, at a time when prices are generally below the costs of production.

While the outlook at the moment is hard for the manufacturer and the operative, it is no worse than the discouragement facing the farmer or the general industrial worker. It should be kept in mind, however, that mills debts are comparatively light and with the first signs of a consuming demand for cloth, mills will come forward and buy cotton. A steadier movement in cotton will mark one of the first sure signs of recovery from the most trying year the cotton goods trade has ever known.

The Carders' Sectional Meeting.

Following out the questionnaire system suggested by F. Gordon Cobb for the Southern Textile Association, the sectional meeting for carders, held recently at Charlotte, is but a natural sequence. That it was a wonderful success at once becomes evident by a perusal of a report of the discussion, which appears practically in full on another page. This movement is a practical effort to demonstrate the rule of the "Harry Wadsworth Club" as given us by Edward Everett Hale, which was "To look up and not down, to look forward and not back, to look out and not in—and to lend a hand."

There seemed to be but one detail neglected. Many of the men were unprepared to discuss certain features because they lacked exact figures. They did not come "loaded" because they had no way of ascertaining just what details were to be brought up for discussion. It has been suggested in this connection that if the sectional Chairman would prepare in advance of the meetings a list of the questions to be brought before his section and have Secretary Carter enclose this list with his announcement of each meeting time and place, it would allow a much greater number to take an active part in the discussion.

The officers of the association and the men who are actively forwarding this movement should be commended. A continued effort of this kind will make men study, and also create an interest in their daily work that is frequently lacking. We do things a certain way until we get into ruts. Our actions and thoughts become mechanical. It is only when we bump into a totally dissimilar practice and find it giving improved results that we discover we are in a footpath we have worn through constant usage.

Spinners to Meet in Spartanburg.

A meeting of the Spinners' Section of the Southern Textile Association will be held at Spartanburg, S. C., on Friday, January 21, it is announced by Carl R. Harris, of Lancaster, S. C., chairman of the Association's Sectional Committee on Spinning. As was the case at the carders' meeting in Charlotte on December 10, there will be a morning session, a luncheon and an afternoon session. Practical spinning problems will be brought up and discussed at both the morning and afternoon sessions, and a representative attendance of superintendents, spinning overseers and others interested is urged.

Morale—The Secret of Industrial Success

BY H. P. WEAVER

GENERAL MANAGER, INDEPENDENCE BUREAU, PHILADELPHIA.

Morale is the steam pressure behind effective leadership. It is the power which gets action in the realm of industry. Without morale a mill is as impotent to produce goods economically as is a locomotive to make a steep grade after the throttle has been shut. It must run on momentum. There are many industrial concerns running on momentum. They pass for "going" concerns; but just *where* they are going it is unkind to inquire. Their executives lack vision; their subordinates lack purpose; rank and file lack precision. All stumble along blindly, their movements uncoordinated, a mere aggregation of individuals seemingly with no common purpose.

Is your mill like that, or is it a well organized team whose members have been selected competitively, each assigned to the position he can play best and led by a captain whose proficiency commands respect and whose leadership inspires confidence? Morale, cooperation, the will to do, effective executive direction,—these are things to conjure with, things to be desired above all material things such as buildings and equipment of stone and steel, or even knowledge of the technique of production; for a well formed organization properly led will quickly secure these material evidences of the ability which it needs to produce the results that justify its existence.

In this article Mr. Weaver brings out some mighty pertinent facts. How does your organization measure up with such views? Does it have forceful, intelligent and well seasoned executive direction? Are you forging ahead or are you drifting? What sort of minor and intermediate executives do you have? Have they been carefully selected, intelligently helped to develop, given the training they need for their work, or have they been appointed largely by guess and left to do their work mainly by good luck? What do you know about your men, anyway? What is their viewpoint, their horizon, their living conditions? What do they know about you? Morale is the secret of industrial success. Are you doing your part toward its improvement in your mill?

These moral and mental qualities are the intangible assets of an organization. Their value is well known to successful executives and to the banker. The latter, in fact, frequently lends money on just such assets, practically unsecured by more material things.

An instance of what morale will do has recently received widespread attention in the case of the Philadelphia Rapid Transit Company. Eight years ago there was lack of leadership, apparently no planning, and morale was non-existent. There had been a serious strike with its usual froth of wild talk, resultant street eruptions, and dregs of bitterness. Then came a change in leadership; vision, ability, and human understanding were put in charge. Seven years later, underpaid but with their now trusted leadership struggling against difficulties, the employees not only consented to a postponement of a deserved wage increase, but they voluntarily offered the use of their own savings fund amounting to a million dollars.

Regarding the executive who brought this about, John Wanamaker wrote recently:

"Before his Philadelphia affiliation we had street car discontent. All transit interests were unpopular, the cars dirty, shabby, and shackly, the schedules heart-breaking, the conductors and motormen everlastingly at war with their employers, and there was constant public suspicion of mismanagement and political exploitation.

"Now, after a few years under the hands of a genius, with a cool head and big heart, the car service of Philadelphia is regarded by many people competent to express an opinion from their practical experience, as the best in the country.

"The cars are clean, roomy, well cared for and convenient. They operate with a regularity and dispatch that is remarkable under our heavy traffic conditions, when you consider the bad street conditions with which they have been obliged until recently to contend.

"The 11,000 employees have become the loyal and devoted friends of the company, they have been welded into an organization, they are for it and not against it."

Is all this the working of magic? No, just the result of square, broad-visioned leadership which took care not only to be fair and aboveboard, but also to make sure that each employee knew the facts fully. This leadership operated upon sound principles, with keen attention to the point of view of the individual.

Contrast that occurrence with the case of a successful and benevolently minded automobile manufacturer. He thought to divide some of his profits with his employees, and in a generously-worded but indefinite announcement he stated that on a certain date a bonus amounting to a considerable percentage of his profits for a stated period would be divided among his employees. The company was obviously successful, and since details were lacking, the popular sport became that of counting the bonus money before it was received. Backed by human desires, ideas of the amount of bonus each individual would receive grew rapidly, until otherwise reasonably sober-minded employees were counting on their bonus money to buy everything from silk pajamas to limousines. An analysis of that company's public statement for the preceding year would have shown immediately that any bonus based on part of the profits would not give very much to any individual employee. But the rank and file employees know but little about annual reports and do not think in terms of balance sheets. Consequently the "let down" when the amount and terms of the bonus were actually announced was tremendous. It had the very natural reaction of making the employees think that the whole thing was insincere, merely a sop thrown to them in lieu of wages they should have received. Opinions differ as to whether

or not this was the real cause of a serious strike that followed, but the fact is clear that it contributed greatly to the feeling which made the strike possible and which protracted it when it did occur.

That executive, a seasoned business man and financier, was trying to do a splendid thing in a straightforward way, but he utterly failed to see the matter from the viewpoint of his employees. In making his announcement he was guilty of an error which would never have been made by the agitators who organized the strike which followed. The agitators were wrong in principle but knew the men, and were therefore able to carry them along against an employer who was trying to do a fine thing in a big-hearted, generous way. But he lacked understanding, and therefore failed. Unless he is unusually broad, his failure will probably urge him powerfully along the road of pessimism in his view of the treatment he may expect from his employees. Had his organization been built on a real comprehension of the human factors involved, his bonus scheme, if undertaken at all, would have been announced in a way to prevent misunderstanding, and would have given the agitators no ammunition.

Breadth of vision, leadership, frankness; these are generalities. You ask what are the specific things an executive may do to improve his organization, to create morale which will produce goods. How can he stop the drifting and set a definite course? These queries are not easily answered. Definite rules cannot be given. At best it will take much time, perhaps years, to get measurably close to the results sought. The most we can hope to do within the limits of this article is to state fundamentals without any attempt to describe methods in detail.

Maintenance of morale is an essential function of management. The fundamentals underlying its performance are:

Leadership,
Organization,
Publicity.

Leadership requires strength of character, broad vision, absolute squareness and sincerity, human understanding of the sort which gets the other person's viewpoint and gives to the other person the viewpoint of the management; coupled with these requirements must be the ability to appreciate and utilize the capacities of others, directing them along correct lines of action but without becoming mired in detail.

The chief executive in an organization of any size cannot really know his employees or they him. He must transmit his orders, his personality and his viewpoint to his immediate subordinates to pass on to all. In other words, each employee knows his immediate boss well, his bigger boss less well, the great big boss usually not at all. It is vital then to select the right men for intermediate and minor executives and develop them carefully. The chief executive is the brains, the executives in direct charge of the working forces are the backbone of an organization.

In establishing a clear-cut organization, selection of these minor executives comes first. No man should be given authority over others unless he can get their respect and hearty cooperation. Leadership must be of the stimulating or pulling variety, not the driving kind. "Does he lead or does he drive?" is a pretty good basis of measurement to be used in selecting a man for a position of authority over others. He must, of course, be square, or he can't lead; he must be loyal, he must have knowledge of the work and good judgment. Other qualities are valuable but less important.

Realization of these simple facts has been lacking, and as a result a common mistake has been to select executives chiefly for their knowledge of their work. But if a man lacks pulling leadership, lacks executive ability, he should never be an executive. If he be particularly expert or inventive, he can probably be staff adviser to an executive. Expressing the principle briefly, it is vital to make sure that all your minor and intermediate executives are really leaders with the ability to get things done, and with the human understanding to get and hold the respect and loyalty of those working with them. Use your experts as consultants and advisers; never make executives of them unless they possess proved executive ability.

"It sounds simple," you say, "but where will I get men who will qualify? That's what I have been trying to do." But have you? Have you really seen the problem clearly as the major matter in building an organization, and then applied to it concentration, brain power, the effort which it deserves? Most executives haven't, or they would have shown better results. Who makes your sub-foremen or foremen? On whose "say so" are they appointed? On what basis is the man judged? Is it because he just "looks good?" Perhaps it is because he is a hustler or perhaps it is really because he will carry out orders without too many questions.

What training do you give sub-foremen? Is it systematic, by one who is an inspiring leader or teacher, and who knows men and knows the work? Or do you just put your hand on a man's shoulder and say "You're boss here now; go to it," and leave it to his department head or foreman to teach him as an incident among a lot of other duties which must be performed somehow. If this is your method, it is a miracle if your corps of sub-foremen and other minor executives, indeed your whole organization, is not put together pretty much in the way a squatter used to build his line fence "by guess and by God." If that's the way it's built, that's the way it works, and the loss of valuable men, friction and probably strikes are living experiences for you.

But careful selection and appropriate placements form only half the story. Lines of authority must be defined and generally known; and the degree of authority accorded each executive or subordinate should be fully commensurate with his responsibility. There should be no possibility of misunderstanding who is charged with executing any policy or program. On the other hand, zeal for certainty should not serve as an excuse for arbitrariness. Each member of an organization whose proper functioning or whose personal interest will be directly affected by any proposed general or "policy" change should be consulted and won over—"sold"—before the final decision is made. To a more limited extent the same procedure should be followed respecting changes in methods of operation. By winning the confidence of subordinates in the motives behind and in the practicability of any proposition, the probability of its success is greatly increased.

There is nothing new about organization building. Executives have been meeting the problem since industry was

young. The last few years have created new conditions. When there are more jobs than men, when human machinery is scarce and high priced, and in many cases less efficient than previously, an organization is relatively more important. The minor executives are the operators of human machinery, and must, therefore, be more skillful than ever before.

There is talk that this shortage of men will pass; but will it do so more than temporarily? Immigration laws may be less strict but more probably not, because the war opened the eyes of Americans to the danger impending from this great mass of unassimilated foreign born. Even if we are willing to admit them, we do not know whether or not we can get them. Europe is short of man power and most governments will do all they can to keep their young men at home.

The Vice-Chairman of The Inter-Racial Council, Frances A. Kellor, is authority for the statement, published in the September issue of "Personnel," that

"The French Government has offered Italy six tons of coal per month for each Italian miner induced to go to France, and the Commissioner of Emigration of Italy is advising his people to emigrate to France. It is asserted that opportunities are better there than in America, both for steady work and high wages. Greece is offering inducements of farms to the people, having passed an act by which large land owners may retain only one-third of their estate, while surrendering two-thirds to the peasants. If this offer should not be sufficiently persuasive, emigration from Greece may be prohibited at any time by law. Similar conditions are found in Finland, where areas have been set aside for settlements and farm implements and supplies are offered to small cultivators on liberal terms."

In any event indications are that we can expect to get only unskilled workers through immigration. Many of our problems will be intensified by any influx of such people.

Undoubtedly the biggest unused capacity for work existing in America today, in the world for that matter, is in the margin between what men *are doing* and what they *can do;* but there are no panaceas to apply, no new or remarkable inventions to get men to do what they ought to do. It is a matter of individual point of view. Each individual must be reached and brought to see where his own best interests lie, and then kept up to the mark. It is a matter of leadership pure and simple, to be applied in each organization.

The work place is the place to reach a man on matters pertaining to his work. Why is it that the agitator seems able to do more with our workers in an occasional hour than industry can do during eight hours a day? It is because the agitator makes it his business to get the viewpoint of the people he talks to, to know the individuals, and to take care of the little things which will appeal to each, while industry and the public talk generally, growl at men's unreasonableness, read all about the strikes, and write letters to the newspapers, but do not act with force and judgment. Ofttimes when they act with force, sound judgment and clear viewpoint are lacking. Then force is likely to become coercion; and there is nothing more sure to make a worth-while man fight and be bitterly unreasonable in his fighting than coercion, fancied or real.

No man is unreasonable from his own viewpoint. How can you judge him until you get his viewpoint? How can he judge you until he gets yours? The executive can and must provide channels for receiving the employees' viewpoint and for giving them his. On the other hand, the worker cannot do this. Whose is the blame if the executive doesn't try?

It is really surprising how little the average, reasonably intelligent employee knows about the fundamentals of business and about his employer's problems in particular. But it is more surprising that the average employer should be unwilling to tell him more pertinent facts about the business. The question of whether or not the employees actually are interested and want to know is not vital. The point is that they can be interested in a way to give them better understanding, and to get them to advance their own interests by advancing those of their employer. When an executive is wondering what he should tell his employees and how he should tell it to them, it is a good idea for him to imagine himself the employee with the employee's horizon, experience, and training, and then ask himself whether if he knew the facts in question they would be likely to help his understanding. If so, the employee should be told.

When facts are told to the employee, it is necessary to make sure that they are presented so that they will really be understood. An instance or two of wrong methods will illustrate this. Recently, the chief engineer of one of the plants of a large power company wished to promote a turbine operator to a position as executive assistant. The turbine operator declined without giving a reason. The chief engineer carried on the entire conversation over the telephone, and it was very evident from the way he argued with the turbine operator, that he considered the latter to be willful, stubborn, and shortsighted. He finally disgustedly terminated the conversation and remarked to a bystander that he would have to promote someone else over the turbine operator's head, and that the other members of the organization would not understand it, believing that the man in line for promotion had been intentionally passed by. When the suggestion was offered that a definite announcement should be made that the first man in line for the position had declined to accept it and it was therefore passed on to the next most eligible person, the chief engineer said that as a matter of policy he could not make announcements on such matters but that he would spread the truth by giving the word to someone who was "loose-mouthed." It would seem that the short-sightedness of such a method would be obvious; but that is a fairly typical instance of what important executives actually do at times, even in organizations commonly considered able and successful.

In another case, also that of a large and successful company, the management took out group life insurance for its employees and made arrangements with an insurance company whereby it offered to the employee disability insurance at the same time and on very favorable terms. A formal announcement was made and posted on the bulletin boards, but it was couched in language which the average high school graduate could understand only after careful study, and probably not fully unless he knew insurance practice reasonably well and was thoroughly familiar with the arguments and advantages of disability insurance. The language was cold, exact, tiresome. Its sales value was negligible.

Of course, the disability insurance was not taken, so an insurance salesman was brought in to sell it by personal solicitation. There was no supervision of his methods,

with the result that he occupied most of his efforts in the writing of individual insurance at the ordinary rate, and did not push the other. Even had he played fair, personal solicitation by an outsider would not have been best. It should have been handled within the organization by simple, straightforward statements, showing each employee just what it was all about, what the benefits would be both to him and to the company, and what it would cost him.

Besides these facts of obvious interest and concern to the employees, many companies are finding it wise to keep the rank and file informed about matters of policy—manufacturing, sales, and even financial. Newspaper reports and financial advertisements heralding the news of stupendous profits, resulting in fabulous annual earnings, enormous stock dividends, or undivided surpluses, are grist to the agitator's mills and are eagerly consumed by workmen who accept such stories as evidence that they are underpaid. Generalizing from a few cases—as we are all prone to do—they ascribe unfairness to one employer as readily as to another. Ignorance of the innumerable concerns which are hardly able to make both ends meet, of the many lean years of even prosperous enterprises, and of the multiplicity of factors determining business success—technical production methods, design of products, patents, demand for goods, governmental regulations, condition of the money market, and no end of other considerations—reinforces suspicion, which originates in the instinct for self-preservation. Publicity is the means which more and more companies are finding expedient not only to allay suspicion but also to enlist positive good will.

How does your organization measure up with such views? Does it have forceful, intelligent, and well seasoned executive direction? Are you forging ahead or are you drifting? What sort of minor and intermediate executives do you have? Have they been carefully selected, intelligently helped to develop, given the training they need for their work, or have they been appointed largely by guess and left to do their work mainly by good luck? What do you know about your men, anyway? What is their viewpoint, their horizon, their living conditions? What do they know about you? Try putting yourself in their position, and then try to think what chance they have really to know about you.

Unless your answers to these questions are thoroughly satisfying there is grave likelihood that morale is not receiving the attention it should be given as the "power behind the throne" in your plant.

Chicago Bridge & Iron Works, 37 West Van Buren St., Chicago, Ill., announce the opening of a new sales office of their organization, at Atlanta, Ga. Joseph L. Zeller, who has been with this company for quite a few years, will be in charge and will handle the states of Georgia, Alabama, Tennessee and Florida. His headquarters will be in the Forsyth Building, Atlanta. This company confines its activities to the manufacture of elevated tanks, large storage tanks and similar plate work, and Mr. Zeller will endeavor to keep in touch with all prospective purchasers of these structures.

Westinghouse Electric & Manufacturing Company, through its department of publicity, East Pittsburg, Pa., is sending out a handy little diary book for 1921.

An Experienced Welding Service.

Autogenous Welding Co., with headquarters at 903 N. Central Ave., Knoxville, Tenn., operate an organization for oxy-acetylene welding and cutting in all metals. This company's operations consist entirely of welding and cutting work, as they do not sell equipment of any kind. Frequently industrial plants are confronted with a welding or cutting proposition which, though they have a welding equipment of their own, they feel is too large or too "touchy" a job to be handled by their own force and be properly done; in such instances, this company's services are at the plant's disposal. And, of course, they do work for plants which do not have welding apparatus on the premises. In such cases the Autogenous Welding Company send experienced operators, supplied with suitable, up-to-date equipment, to the plant desiring their services, and the welding or cutting job is done promptly and according to the wishes of the customer. No job of this character is too large for them to handle, and none is too small, they state. They will send their welding force to any location in the South.

This company has done heavy work for the Brookside Mills, Knoxville, Tenn., on a 1,200 h. p. engine cross-head and main bearing cap; for the Knoxville Cotton Company, the Knoxville Iron Works, and for every cotton and knitting mill near Knoxville. At the Laurel River Logging Co., Runion, N. C., they handled a 7,000 pound job, and have just welded two cylinders on two locomotives that were shut down entirely for the Tellico River Lumber Co. They have recently finished a job on an 18 by 24 inch cylinder on an air compressor for the Thrasher Marble Co. Among their other customers are the Knoxville Marble Co., the Red Ash Coal Co., the Ross and Republic Marble Co., the Appalachian Marble Co., and the W. J. Oliver Mfg. Co. All these jobs were extra large ones and in most cases caused a shut-down of the plants until the welding job was completed.

The Detroit Steel Products Company has increased its capitalization to $5,250,000, and declared a common stock dividend of 300 per cent, thus distributing a portion of the company's surplus, which has accumulated during the past ten years. The management believes the time is opportune to strike an optimistic note and, at the same time, to afford the stockholders control of their share of this surplus.

President J. G. Rumney states that the company's branch offices and agencies, located in every section of the United States, support this feeling of optimism, as shown in recent reports of conditions in their respective environments. Foreign representatives also report improved conditions.

Mr. Rumney also states that from a small beginning, dating back about sixteen years, the company has grown to its present size, and he is confident that the record of growth will be continued. During the existing dull period, everything possible is being done to give employment to employees, who would otherwise be idle, in a thorough overhauling of the plant and equipment, so that increased efficiency may be insured and the whole organization put in a superior condition to meet economically the expected improvement in demand.

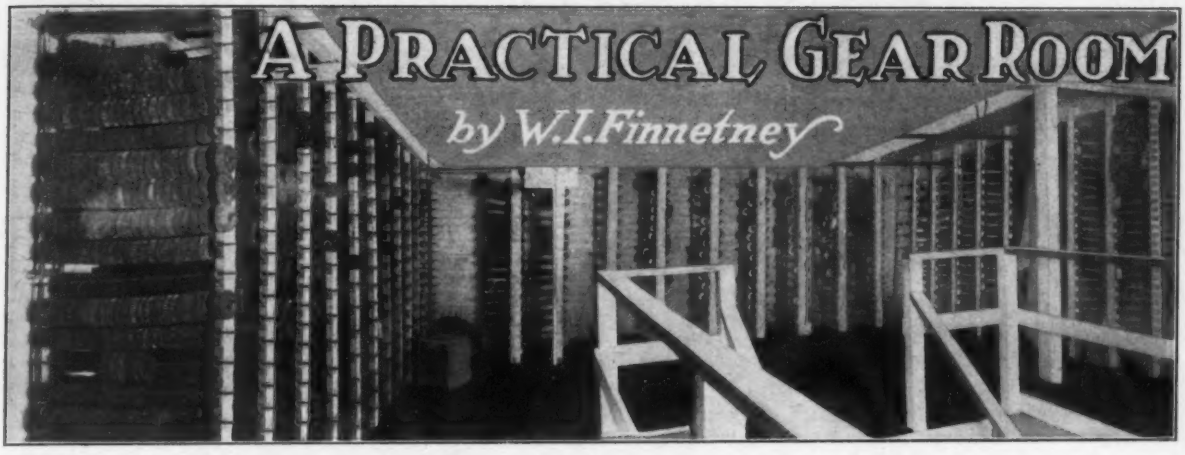


FIG. 1. THE GEAR ROOM AT TALLASSEE MILLS, TALLASSEE, ALA.

A problem common to all mills, and one that frequently gives those in charge no small concern, is that of keeping change gears suitably assorted and listed and knowing that the proper change gears are being run on the frames.

It is probably a safe assertion that not more than half the mills are actually running the twist factors, or multiples, which they consider as their standards, and which are supposed to be used. Not only this, but they have no system by which such differences can be promptly detected.

To illustrate: let us suppose that there are 20 spinning frames which it is necessary to put on 18s yarn, and that for this number the proper twist gear, using the twist factor adopted as standard by the mill, would be one with 26 teeth. When the different sizes of change gears are kept where they are easily accessible to all the section men, is it not possible, if indeed not highly probable, that gears of 25 or even 24 teeth may be put on?

Where the gears are not kept properly separated and well cleaned (something that is not always done in the average spinning room) the particular size of change gears desired will be difficult to find, with the probability that if the nearest to the right size is not substituted, the machine shop will be called upon to cut more gears of the desired size. Although there might be a number more than wanted already in the room, because of their being piled in an indiscriminate heap in the place where they are supposed to be kept, or being thrown under the frames in the spinning room, the men naturally follow the line of least resistance and order others from the machine shop. It was to overcome this condition that the Tallassee Mills devised a change gear system by which all change gears not in use are taken from the mill and kept in a room in the machine shop that was especially designed for the purpose.

Figure 1 is a photograph of a part of this room showing the arrangement of the gear racks. A list of the standard change gears is furnished each department. A typical list is shown at Fig. 2 and is for the spinning room.

MT.V.W.M.INC.NO.237 REQUISITION FOR GEARS

Tallassee MILL DATE 11/29/ 1920 No.

TO GEAR ROOM KEEPER
PLEASE DELIVER THE FOLLOWING GEARS

NO.	NO.	NAME AND MAKE OF MACHINE	HANK ROVING	NO.& PLY YARN	KIND OF CLOTH
15 DRAFT	26 TEETH	Lowell Wp. FOR		#10	
15 TWIST	36 "	Lowell Wp. "		#10	
PICK	"	"			
	"	"			

OVERSEER

FIG. 3. THE GEAR ORDER FORM.

TABLE OF SPINNING FRAME TWIST GEARS, TALLASSEE MILL NO. 2.

WARP TWIST—6's TO 26's YARN—LOWELL AND SACO-LOWELL FRAMES.

Yarn No.	Twist Per In.	Twist Gear Lowell	Twist Gear Saco-Lowell
6	11.64	47	52
7	12.57	43	48
8	13.43	41	45
9	14.25	38	42
10	15.02	36	40
11	15.75	35	38
12	16.45	33	37
13	17.13	32	35
14	17.77	31	34
15	18.40	30	33
16	19.00	29	32
17	19.58	28	31
18	20.15	27	30
19	20.70	27	29
20	21.24	26	28
21	21.77	25	28
22	22.28	25	27
23	22.28	24	27
24	23.27	24	26
25	23.75	23	26
26	24.22	23	25

Twist Constants.—Lowell, 541.66.—Saco-Lowell, 599.00.

FIG. 2.

When change gears are desired an order is made out on a form as shown by Fig. 3, and sent to the gear room where the order is held on file until the same number of gears that were issued on the order have been returned; the gears that are returned being those that were taken off the frames when the number of yarn being spun on them was changed.

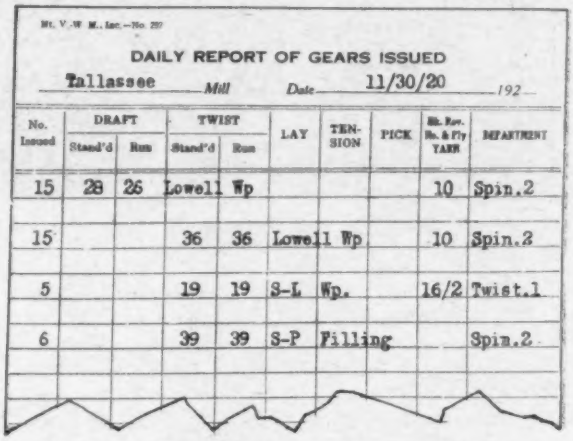
The man in charge of the gear room then lists the number and size of gears and the department to which they were issued for the daily report made for the superintendent's desk, as shown at Fig. 4.

This system has been found to give very satisfactory results, in not only showing the superintendent what gears are being actually used, but in assuring both the overseers and the superintendent that the proper gears are being used; for should any gears be delivered which were not the proper size for the number it was desired to make, the fact will be promptly shown on the gear room report made to the superintendent and the cause for the deviation therefrom found.

The spinning room has been used in illustrating this system, but it has been found no less beneficial in the results obtained in both the carding and twisting. Anyone who has worked in the carding department is aware of the tendency of the section and frame hands to correct all evils by changing the twist and tension gears.

That such a system will be helpful in maintaining more even numbers of yarn and of roving goes without saying; for obviously, however unintentionally the difference is made, if there is a certain number of gears of different sizes running on frames making the same numbers, there will be a wide variation in the work produced by these frames. This is true whether the gears in question be twist gears or draft gears. It is no doubt true that a certain number of mill men will not admit the need of such a system in their plants. Still there is no disputing the fact that it supplies the proverbial ounce of prevention, and keeps those responsible in absolute touch with the changes that are being made in the mill; a condition that is certainly very much to be desired.

In addition to this, it prevents the making of a great number of gears during the period of a year that might otherwise have been made, because the desired gears were not to be found; besides the saving of time effected by having the gears regularly accessible at all times. These two items would probably repay the cost of the system during the year.



DAILY REPORT OF GEARS ISSUED

Tallassee Mill Date 11/30/20 192

No. Issued	DRAFT Stand'd	DRAFT Run	TWIST Stand'd	TWIST Run	LAY	TENSION	PICK	Rev. & Ply YARN	DEPARTMENT
15	28	26	Lowell Wp					10	Spin.2
15			36	36	Lowell Wp			10	Spin.2
5			19	19	S-L	Wp.		16/2	Twist.1
6			39	39	S-P	Filling			Spin.2

FIG. 4. DAILY REPORT FOR THE SUPERINTENDENT.

But what will commend it to most mill men is the assistance that it will give toward securing more even weights and numbers as well as furnishing them with accurate information regarding the gears and twists that are actually being run in their mills, all of which are reflected in the quality of the goods produced.

Let us Find the Silver Lining!

Under the foregoing heading the Hyatt Roller Bearing Company, Industrial Bearings Division, New York, are sending out to their fellow manufacturers throughout the country the following "jinx-dispelling" message of optimism:

"Just as surely as there is a silver lining to every rain cloud—just so surely is there a silver lining to the cloud of business depression now hovering over us.

"The rain cloud's silver lining is the good old sunshine—powerful, unchanging, shining brightly.

"The depression cloud's silver lining is the fundamentally sound condition of our great country—its limitless resources, its progressiveness, its men of brains.

"As manufacturers of the necessities and comforts of life we have a definite, important, useful place in the development of our country, and just beyond the present there's a real, lasting demand for our products.

"Let us make our products better than ever before; let us sell them on a broader scale; let us get down to intensive, hard work with full faith that better business is within our grasp if we will make the effort.

"Let us as American manufacturers find the silver lining now!"

Cloth Costing and Production

BY JAMES WARD.

The object of the writer in calling attention to this subject is a twofold one—(1) to promote keener interest in the subject of cloth costing with a view to the establishment of a reliable and scientific basis and (2) to show some ways in which looms can be made to do more.

Cloth costing and production are inseparable inasmuch as the one is entirely dependent upon the other; and there can be no really accurate costing without carefully kept records of the pick production of the different classes of goods. The records may be carried out on different grades of cotton warp for the same kind of work; different loom speeds; and different sections of the weave room. These records should be kept from month to month, year to year, and if necessary spread over periods of years in order to find their averages and keep track of their tendencies and possibilities.

The primary object of cloth costing, of course, is to determine before making a cloth the price at which it can be sold, and if the manufacturer considers the price as likely to be unacceptable to the prevailing market prices, he will set about to find ways and means to reduce the cost in order to be able to put his goods on the market with a suitable margin of profit. Assuming the maximum of a considered efficiency has been reached, or that a plant is doing as well as its neighbor, the problem is sometimes met by a cut in wages, considering wages form too large a percentage of the cost. The question ought not to be "How little can be devoted to wages," but "How much." It is the part of the employer to see that facilities for production are given, and then it is his right to demand that they be taken advantage of. Wages are measured solely in terms of production. It ought only to be the inefficient manufacturer who bewails high wages. The efficient manufacturer should wish for wages so high that his less efficient competitor will be compelled to go out of the business.

There can be no possible doubt but that the manufacturer must face the problem of producing goods more economically than has been the case recently or even than was the case previous to the start of the war—an accomplishment only made possible by increased efficiency. Our ideas of what constitutes efficiency must not remain fixed—for instance, what might have been considered efficiency when cotton was 12 cents a pound will not be so considered when cotton is 20 cents a pound. What might have been considered efficiency when operatives were available at $15 a week, could not be considered so when operatives are available at $30 a week.

If the methods of production are changed to suit the wage, instead of attempting to change the wage to suit the production the higher rates of the war period can be converted into a low rate. Of course wages decline if production is inefficient. There is nothing sacred about pre-war wages, and no logical reason why we should revert to them at all, or even refer to them. Possibly trade unions have some grounds for their fear that the employer is not always after better methods for the benefit of the worker or the public. "He wants increased returns and yet fails to express the increased efficiency in lower prices and higher wages." With profit we could scrap the antiquated and unscientific dogmas of the trade and concentrate effort, thought and science upon production — the essential factor in all industry.

"In a mill all roads lead to the loom, it is the center around which everything revolves and might well be called the sesame to profit. * * *

"I look forward to the loom of the future as one that shall be equipped with pick indicators by which both fixers and weavers shall be paid; one that shall attain a speed of anything up to 300 picks per minute; one that shall embody operations at present performed outside of and apart from the loom of the present; and one producing such results as shall make textile men of the future wonder how we were ever content to accept such a paltry service as 60 or 70 per cent of the loom for production.

"It is only by introspection, not retrospection, that we can hope to keep America as the leading textile country of the world."

Cloth Costing.

To arrive at the selling by any system the aggregate of three factors is required: (1) materials, (2) cost of conversion, (3) profit.

Material. Warp—The amount or quantity of materials is about the same to all, being governed by calculations. In some cases it is usual to put in a few leas finer cotton and add sizing ingredients for weight. In others an effort may be made to cut the cost by substituting an inferior warp. In order to risk this the manufacturer must know his goods thoroughly—for instance, it would not be wise to take chances in an over-square cloth, while in a square, or under-square cloth, particularly in the latter, such might be possible without in any way lessening production. The substituting of a poor warp is more often than not an expensive item, as on the one hand it may lower production and cause dissatisfaction among the help, and on the other hand increase the overhead expenses. If a poor warp increases the time allowed to weave a given piece of cloth by five hours, then we have five multiplied by the number of looms running on the inferior warp which equals the total number of extra hours at the calculated rate per hour for overhead charges. Against this the use of a good warp will result in good cloth, higher production, satisfied help, and also a good name, apart from the reduction of the weaving time by several hours, thereby reducing the overhead charges by a considerable amount. There need be no fear that the loom containing the good warp will not be tuned to as fine a point as the one containing the poorer warp. It is up to the overseer to see that all new warps are correctly started, as all new goods entering a loom should be check-

ed by a competent person to see that everything is correct.

A point sometimes lost sight of and most important in view of the present high prices of materials is that a production considered good when cotton was 10 cents a pound will have to undergo a considerable increase to be considered good when cotton costs as much more.

With very little labor a useful production table can be made showing at a glance the number of picks per minute obtained from a given piece of cloth in any number of hours. In cotton calculations for warp quantities it is usual to make no allowance for waste. This is a matter which should be carefully gone into from time to time, and it is well to make sure all warp waste is accounted for. To give an instance of what I mean—in a mill making ginghams and shirtings with a silk or colored spool. Often this spool ran out before the warp beam by 20 or 30 yards, which it was customary to cut off and make into waste, making anywhere from, say, 5 to 10 pounds of the latter. Also, in the case of a new warp, the cut mark is too far by some yards from the starting end of the new warp, which as often as not results a waste of both warp and filling as it is considered that good cloth should only commence with the cut mark. While the finish of the warp beam invariably finds the cut mark again out of place. Granted that cotton does stretch, that is no excuse for the smallest amount of waste either in the slasher room or weave room.

Mention need not be made of the doubtful practices in the trade, they are well known to those who indulge in them and no mill with a reputation wishes to know them.

It would be interesting to know how many mills have succeeded in reducing their supply and waste percentages in proportion to the present increased prices, or even the number that have attempted to do so. It is not unusual to find the filling quills or pirns not more than half full, resulting in extra and needless waste at the refilling of the shuttle, as well as a loss of time to the weaver, not only on the loom requiring new filling, but invariably upon the remaining looms.

In many cases the waste in the weave room does not come within the purvey of the records, if any, or material calculations, for two reasons—(1) in many weave rooms the waste is seldom collected from the weaver. I have known weeks to elapse and no collection made. (2) I have noticed the floor around most weavers' looms literally covered with waste until within half an hour from each stop, when it was brushed up by the weaver and thrown into a box placed in a convenient place in the weave room. No doubt the original intention in placing such a box there was to encourage cleanliness and to receive the loom cleanings, etc., but this having been lost sight of by some, and ignored by others, a ready and easy means was placed within reach of the weavers to dispose of any surplus waste. Of course a worker should never be allowed to have waste lying about so. Such instances serve to show how easy it is to frustrate a correct percentage of waste being obtained, and therefore a correct reckoning of materials.

Might I point out while on the subject of filling, one simple fact—if the filling on a quill or pirn gives the weaver trouble, everyone knows what happens—at the first opportunity it is cut off and thrown into the waste. With this as a primary fact, no effort should be spared by the preparing department to put the filling on the quills in the most perfect manner possible and give to the weaver a good and well filled quill. Some of the faults or filling troubles are (1) filling wound too softly onto the quills caused by insufficient tension when winding, (2) many of the knots tied on the filling are left with long unclipped ends which catch and break the leading end. No extra work would be entailed in tying a proper knot and clipping the loose ends. (3) Defective quills —it is quite an easy matter for the winder to put such on the one side for examination, to use it means waste. Another hindrance to the weaver is the dropping of the quill tongue of the shuttle, through wear or abuse, from the level of the shuttle eye, thus causing the filling to break when the quill is but half empty, causing loss of time to the weaver, apart from the possibility of the latter part of the filling going into the waste. In fact the loom shuttles do not receive one-half the care or consideration they are entitled to, but such does not come within the scope of the present article.

The loom is the first machine in the mill in which we find the work of the preparing departments—the warp and the filling—brought together. Whatever tests may have been made previously, the loom is the real testing machine, the profit producer of the trade. No matter how fast we may spin or prepare, we cannot produce beyond the capacity of the loom. That being so, everything is worth while where the loom is concerned. No matter should be considered too small for consideration. Out of the many things which retard the loom and which should be recorded for costing purposes, I have pointed out but a few which I consider are worthy of attention. In costing jacquard work, account should be taken of such items as the cost of designing, pattern, and harness, also the life of the pattern and harness. These should be charged either in part or whole to a particular order. For example, if the life of a pattern be 300 pieces and an order be taken for 1,000 pieces, we should require to charge against the 1,000-piece order three and a half times the cost of the pattern.

Cost of Conversion.

This heading I shall divide into three sections, (1) costs or wages charged direct to the cloth, (2) costs charged indirectly, (3) costs varying.

Costs charged direct to the cloth. Such charges begin with the winding onto spools for the warper, and in the case of the filling with the winding onto quills for the shuttle, and include such items as warping, slashing, filling winding, drawing-in, weaving, and fixing; also the cost of design, pattern cards, lacing-tape, and overhauling. The amount of direct costs depends absolutely upon two things, the human element and the loom. The human element—trained man power—is admittedly one of the greatest assets to any industry. Many great businesses have been built up on the principle that each individual employed must give an established percentage of result, otherwise they would be dismissed. I have no doubt much good would result to the textile trade if this principle were applied. Good for the manufacturer in the form of increased production, and good for the worker as she would understand she had either to get on or get out. I have always found too many camp followers in the weave room, but I must also say I have invariably found them responsive to encouragement and assistance.

To illustrate my point let us take $3.00 as the schedule price for a given piece of cloth no matter how many hours are occupied in weaving it, and assuming a reasonable time in which to do it, reckoned on the basis of 50 or 60 per cent of the loom speed. A good weaver may get 80 per cent

of the loom speed and take off the piece in say 5 to 6 hours under the scheduled time. This means a saving of 5 or 6 hours overhead charges. Certain classes of cotton, or goods, may contribute to such results, but the principal factor is the weaver. It is quite possible some manufacturers may be in such a position that they have to accept whatever result comes from the weave room owing to an insufficiency of skilled help.

Under this heading one more fact deserves consideration —fixers sections on the same class of work give widely different results. From one section may be obtained a 120 pick result, while another may fail to reach 100. This is most important as the costs charged direct must be based on the pick result from the weave room. The costing department requires to be kept in close touch with all these points, in order to get a correct cost.

Items not charged direct to cloth. Under this section come all such charges as interest, depreciation on buildings and machinery; rents, rates, taxes; motive power, lighting, heating; repairs and renewals; salaries, office expenses, etc. These items make a formidable total most of which is incurred whether a year's trading has been good or bad. Each yard of cloth produced should bear its correct proportion, which is bound to vary with the production of that particular cloth. Assume that the foregoing items make a total which for our purpose we shall say is $5,000. To divide this sum, as some do, by the total looms, can hardly be said to give a correct proposition as looms vary in width and cost. It could scarcely be considered correct to let a 40-inch R. S. loom carry the same proportion as a 90-inch R. S. loom, as the latter requires more power, space, etc. Having found the total representing the overhead charges, find also the total reed space of the weave room in inches. Taking the total reed space in the weave room as 25,000 inches we have $5,000 divided by 25,000 inches equaling 20 cents per inch. Thus a 40-inch R. S. loom would carry $40 \times 20 = \$8.00$; whereas an 80-inch R. S. loom would bear $80 \times 20 = \$16.00$. This gives, in other words, what might be termed the loom rent, i. e., what it would actually cost the company to have a loom idle for a week. Or we might present the matter in this way—for every hour the 40-inch loom is kept idle the cost would be 14.54 cents, and the 80-inch loom twice that amount.

Costs Varying. Under this section are included such items as vary according to value, and are easily reduced to a percentage on sales price—interest and insurance on stock-in-trade; claims and unavoidable losses; discounts and commissions.

Profit. Each mill may set its own requirement per loom, or the manufacturers, as in some sections, may agree upon a certain percentage of profit. Profit for a producer or manufacturer differs from that of a dealer or merchant as it depends upon the amount of labor or machinery employed, or work done. I refrain from figures for obvious reasons. It is contended that it costs for conversion one manufacturer the same as his fellow manufacturer, to make the same category of cloth. Adding that the only way for one manufacturer to beat another is by paying lower wages. I find it difficult to agree with such a contention, as the efficient manufacturer is bound to produce goods cheaper than the inefficient one. We find a difference of 20 per cent and more in the production figures of mills situated in the same section, and also a big variation in the amount of supplies used, and the percentage of waste made. Apart from material costs—in preparing, weaving oversight, and production, especially in the latter—there is an ever increasing scope for the competent manufacturer producing goods much cheaper than his competitors. This point I shall treat at greater length under the heading of production. Much good would be accomplished if manufacturers, at their usual meetings, would discuss such subjects as production, waste, power costs, etc. It would give an exchange of ideas, and make for the stability of the trade. Or each manufacturers' association could compile for guidance a minimum basis of costs for the different classes of goods, subject to variations, with allowances for waste, discounts, etc., and containing general provisions and definitions. Such a table would, I believe, serve to eliminate a lot of reckless quotations. Besides, the manufacturers would have the benefit of the best brains of the trade to guide them, and if desirous of cutting prices would not be dependent upon self-interested parties, nor unreliable sources for his information.

Production.

In a mill all roads lead to the loom, it is the center around which everything revolves, and might be well called the sesame to profit. It would seem as if by its name, its noise and the unceasing care it requires, it was crying out for the attention it deserves. Yet it is only within the decade or so that any improvements worth while have been added. I cannot help but feel that if loom makers had applied themselves to the study of textile mechanics during the growth of the industry, with the same energy the engineer has applied to the study of the internal-combustion engine, the electric motor and the automobile, I am certain we would have a more perfect loom than we at present possess. In fact, many parts of the loom seem to indicate the work of the practical man, who, in far too many cases, did not possess sufficient mechanical knowledge to understand exactly what he required.

Of the several ways of dealing with the subject of production, I propose to deal with it from a pick standpoint, for two reasons, (1) because of its accuracy, and (2) because it is the most simple method when properly understood. While it is admitted that trained manpower, and machine efficiency, are two requisites absolutely necessary to any production plan, we must never lose sight of the fact that there are different degrees of trained man-power, and different ideas of machine efficiency. I shall take first the much debated point of loom speeds, and at the outset make bold to say we drive at least 90 per cent of our looms too slow. I am perfectly well aware that there are many who differ with me on this point, and that there are some who would say that one pick per minute too fast might wreck the mill or would hold up their hands in horror and cry "Overspeeder! Overspeeder!" Many consider that we have reached the maximum speed limit of the loom, and there seems to be a general satisfaction with our attainments in that respect until it has become a canker in the trade. On the one hand a faster loom is objected to by most fixers partly because the idea does not appeal to them in the first instance, and secondly because it is generally looked upon as involving more work. Certainly it will take more patience and a much more accurate setting of the loom parts. It is only natural to conclude that the faster the speed at which the loom is driven the more accurately will the setting and tuning require to be done. But this is no argument against the faster loom. On the other

hand, some manufacturers dismiss the subject by taking refuge behind some such statement as, "It takes a lot more for upkeep and repairs"—a weak and puerile argument.

It is quite true that loom parts will require to be renewed sooner, the faster speed having worn them out quicker, but it must be remembered that in number of picks produced they have had exactly the same life. Apart from breakages due to the increased speed, the ratio of loom upkeep to production is bound to be the same—I fail to see how it could be otherwise. I say apart from breakages because many such will undoubtedly be the result of prejudice, others be caused by carelessness. If the necessary adjustments are correctly made for changing a loom from 155 picks to 170, no extra breakages will occur, and besides the only part likely to give any trouble will be the pick motion.

But if no attempt is ever made to attain a higher speed the drawbacks to such will never be discovered. Almost every fixer can tell of certain looms in his section that will stand any amount of speed, and of others that are giving no end of trouble with their present speed. Why should we not try and discover the good points from the looms that will stand speed and copy them, in fact embody them in a high speed loom. Just now, loom makers have been concentrating upon automatic looms, with the one object in view—higher production. A high speed loom has not received attention simply because there is no demand for it. In the days of the hand loom it was thought an almost impossible thing to drive a power-loom at 150 picks, just as today 250 picks seems an impossibility in the high speed loom of the future. Calculations for output are based upon the loom speed. A loom having a speed of 155 picks and reckoned as giving 60 per cent of speed for output, would give an approximate result of 93 picks. Supposing we alter this loom to 180 picks per minute and take the same percentage for output, we get 108 picks, a difference of 15 picks per minute.

Looked at in another way, the loom driven at 155 picks would take 31 hours to weave 85 yards of a 54 pick cloth, and the 180 pick loom would do the same work in 27 hours. Reckoned on the same percentage, 60 per cent, the 180 pick loom would gain 8 hours on the 155 pick loom in a 55 hour week. In jacquard work many alterations will be necessary before increasing the speed, the setting, timing and tuning of the cylinder, the timing of the hooks, the opening of the sheds, etc. But even here I have obtained excellent results from a fast speed. The high speed loom I look forward to as a machine of the future; the faster loom is a possibility of the present, this I am prepared to prove by demonstration if necessary. Who shall decide when a loom is over-speeded—shall we leave it to the fixer, the overseer or the superintendent? I would leave it to none of these and least of all to the fixer—I should let the matter be decided by results. In most weave rooms increasing the loom speed requires much care and tact, as many prejudices have to be overcome, arguments have to be met and many instances of failure will no doubt be narrated, but we need not be deterred by any of these. I make bold to say that a faster running loom with unlimited speed will give better results than the average automatic loom.

But I must not stop with speed, as there are other ways in which we can make our looms do more. It is no uncommon thing to find the weaver being given quills or "pirns" but two-thirds full. Surely the quill was made to be filled. In fact we should aim at a larger quill. Reducing the matter to figures and allowing six minutes as the length of time taken to weave a quill two-thirds full, we have

$$2/3 \text{ quill} = 6 \text{ minutes} \times 10 = 1 \text{ hour}$$
$$3/3 \text{ quill} = 8 \text{ minutes} \times 7.50 = 1 \text{ hour}$$

In other words we have five unnecessary stops in two hours, averaging 40 seconds as the time lost on the loom owing to the filling running out, a loss of 1.66 minutes per loom per hour $\times$ 55 hours = 1.52 hours per loom per week. I consider 40 seconds a low average, even taking into consideration the fact that at times the weaver will stop the loom before the filling runs out. When the filling does run out there is the cloth to let back, the shed to clean, and in the case of dobby or jacquard work, the cards to reverse.

Mention has not been made of the time lost on the other looms owing to the unnecessary stops. On this one count alone it would be necessary in a weave room of 800 looms to reckon 2.75 per cent of the total looms as being continuously idle.

Before leaving the subject of quills and filling, a very common fault is for the winder to leave her starting end loose and long. This, unless closely clipped, catches on and breaks the leading end during weaving.

What shall I say of weavers kept waiting four days for a new lay; a whole day before a start is made to put in a warp smash; or of those kept idle for two days for a silk spool which has run out before the warp beam. How in reason anyone can expect production under such management—or mismanagement—I fail to understand. Spare parts of all descriptions should be kept ready for the looms, and the weaver should not be allowed to want for anything. The management of every plant should insist on running tests being taken in various ways, on different classes of work and sections, to analyze and count the stoppages, and if carefully gone into it will yield some surprising information.

Even the foregoing list does not exhaust the many things which prevent our looms from doing more. We frequently find the warp beam about ¾ full resulting in a 25 per cent increase for drawing-in and a loss of time to the fixer and weaver, apart from extra waste, and seconds, and an increased possibility of mistakes. Overseers should have no difficulty in deciding how many pounds of cotton a given warp beam will hold. The following is a formula—the flange diameter squared times 0.7854 minus the barrel diameter squared times 0.7854 times the width of beam in inches divided by the constant number. I think the easier way to find the constant number would be to weigh a selected number of beams and take the average number of cubic inches occupied by one pound of yarn for use as a constant.

Warp breakages due to a warp yarn having shires (thin places), slubs and knots is another serious hindrance especially in medium and fine work. An examination of the latter will serve to show that 90 per cent of the knots tied on yarn are either too large, in the form of a bow, or a kind of a slip knot. I know from experience that this is a difficulty not peculiar to the American cotton trade. We need to devote more time and attention to the things that hinder the weaver and the loom, and apply a remedy, never losing sight of the axiom that "where there is a will there's a way."

I look forward to the loom of the future as one that

shall be equipped with pick indicators by which both fixers and weavers shall be paid; one that shall attain a speed of anything up to 300 picks per minute; one that shall embody operations at present performed outside of and apart from the loom of the present; and one producing such results as shall make textile men of the future wonder how we were ever content to accept such a paltry service as 60 or 70 per cent of the loom for production.

It is only by introspection, not retrospection, that we can hope to keep America as the leading textile country of the world.

To Standardize the Application of Individual Motors to Textile Machinery.

For the past five years there has been a considerable movement among the textile manufactures to apply motors to textile machines as individual units. Up to the present there has probably been in the textile field alone more than 10,000 applications of chain drives, and these applications have been in actual use long enough to show beyond a question of a doubt that the results obtained have proven all that is claimed for this method. The individual applications which have been in use have long since passed the experimental stage and met the objections on all points which have been raised by the skeptical.

Of late there has been a movement among the engineers, equipment manufacturers and users to standardize such drives for each machine and a successful and final meeting was held in Boston on December 8 at which all the manufacturers of textile spinning machinery, the various manufacturers of electric motors and the manufacturers of silent chain drives were present. A luncheon was served by the Saco-Lowell Shops, of Boston, and E. E. Blake, agent of the Saco-Lowell Shops of Biddeford, Maine, acted as toastmaster, ably assisted by the genial Jimmie Strang.

F. L. Morse, president of the Morse Chain Company, who has had in the past considerable experience in standardization of machinery for automobiles, airplanes, etc., presided over the meeting and the discussions by all present were entered into heartily and conscientiously with a spirit of give and take to accomplish the desired results, a tentative standard being decided on. There remains now only the arranging of these standards in proper form.

George Wrigley, of J. E. Sirrine & Company engineers, Greenville, S. C., was present and gave the meeting the benefit of the experience and results that his company had obtained for their clients in individual motor application for textile machinery in various mills.

Not only has a demand arisen for individual applications on new machinery, but mills who are investigating are asking that their old machinery be equipped with individual motors, and many thousands of machines have been so equipped. That this application to old machines has shown beneficient results in production and quality of manufactured product is evident from the continued inquiry and the added number of installations.

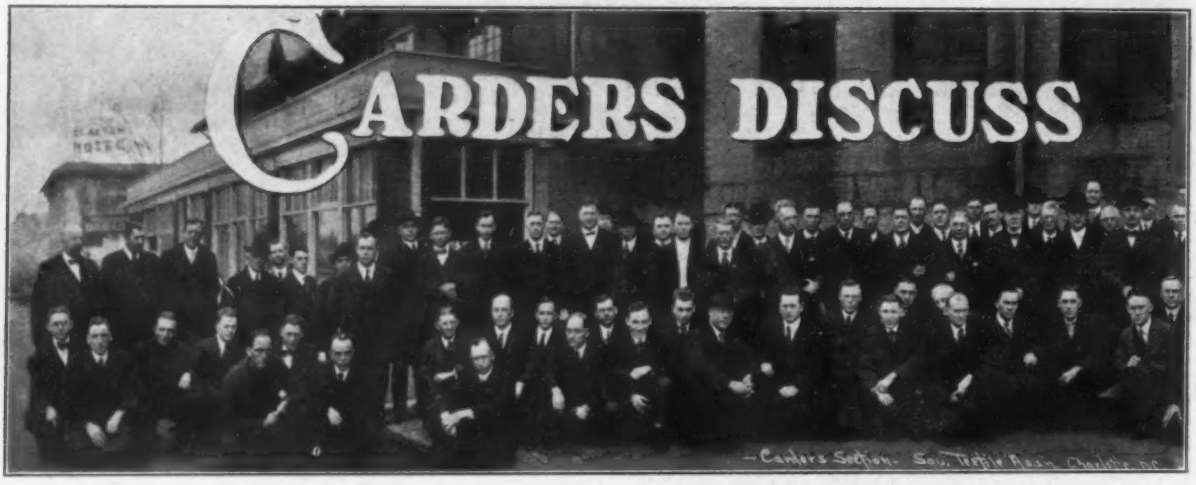
When such a body of men, representing the leading manufacturers in their lines, meet together and are willing to make changes in their product as to details, to get a standardization, it shows conclusively their belief in the future trend of power application not only to textile machinery, but to other machinery as well, and they are but getting ready to handle the demands of the trade as well as the demands of engineers along this line.

Those present at the meeting were as follows: Representing Saco-Lowell Shops, E. B. Blake, agent, Biddeford, Maine; D. H. Goldsmith, manager, Lowell, Mass.; George G. Goodchild, engineer, Lowell, Mass.; Gardner W. Whiton, engineer, Biddeford, Maine; Alexander Rankeillor, superintendent Biddeford, Maine; F. D. Howe, assistant treasurer, H. B. Lord, sales manager, and Jimmie Strang, Boston. Representing Allis-Chalmers Co., Robert S. Fleshiem, assistant manager, electrical department, Milwaukee, Wis.; C. W. Steen, textile motor engineer, Norwood, Ohio; W. N. Ober, sales representative, Boston. Representing General Electric Co., C. A. Chase, manager, Boston; L. F. Adams, engineer, Schenectady, N. Y.; William A. Mayor, mill power department, Boston. Representing Morse Chain Company, F. L. Morse, president, Ithaca, N. Y.; J. S. White, manager, Boston; George W. Pritchett, southern manager, Charlotte, N. C. Representing Link-Belt Company, J. S. Watson, sales manager, Philadelphia; H. D. Mitchell, engineer, Philadelphia. Representing Westinghouse Electric & Mfg. Co., C. T. Guildford, textile engineer, East Pittsburgh, Pa.; O. E. Schoenfield, engineer, East Pittsburgh, Pa.; C. B. John and G. D. Bowne, Boston. Representing H. & B. American Machine Co., J. A. Perry, Jr., and E. L. Martin, engineers, Pawtucket, R. I. Others present were George Wrigley, J. E. Sirrine & Company, Greenville S. C., H. C. Beede, manager, Fales & Jenks Co., and Woonsocket Co., Pawtucket, R. I.; J. S. Eaton, engineer, Mason Machine Works, Taunton, Mass.; L. G. Benedict, engineer, Lincoln Electric Mfg. Co.; C. C. Lamb, Whitin Machine Works, Whitinsville, Mass.; Arthur H. Coffin, branch manager, Robbins & Meyers Co., Boston, Mass.

Creative Chemistry.

This is the title of a book written by Edwin E. Slosson, M.S., Ph. D., a scientific writer of note, who is literary editor of The Independent and associate in the Columbia School of Journalism. It is written especially for the layman, and assumes no previous knowledge of the science of chemistry by the reader, dealing with its subject in an interesting and easily understandable manner. In plain language it describes the modern processes of the chemical industries, and in a vivid and entertaining style it explains the political and social effects of the achievements of the present-day chemist. It is illustrated and contains 311 pages, and is published by the Century Company, 353 Fourth Ave., New York City. A copy was sent to the editorial department of COTTON through the courtesy of the E. I. du Pont de Nemours & Company, Dyestuffs Sales Department, Wilmington, Del.

The H. K. Ferguson Company, 6523 Euclid Avenue, Cleveland, Ohio, has prepared for distribution a new catalog of their standard factory buildings. This contains 56 pages printed on coated stock, and is well illustrated with examples of Ferguson buildings. This company recently opened up a southern department at 815 Austell Building, Atlanta, under the direction of Richard W. Alger, and are going after southern business.



A genuinely interesting and beneficial meeting of mill men was that held by the Carders' Section of the Southern Textile Association, at the Selwyn Hotel, Charlotte, N. C., on Friday, December 10. There were approximately 175 in attendance, the majority being overseers of carding and mill superintendents.

This meeting was called as a consequence of a meeting held in Charlotte two weeks previously, at which were present the officers and sectional committee chairmen of the Southern Textile Association. It was for the purpose of determining a series of meetings of the character of the one held on carding on the 10th that the previous meeting was held; to in some way formulate a plan whereby the association might be of still greater value to its members and to the mills with which they are connected. The unqualified success of the meeting of carders which followed, the benefits which were undoubtedly accrued as a result of the meeting, and the interest shown so promptly in the meeting by the large number of practical mill men who attended, has demonstrated the value of such gatherings.

The most striking features of this meeting, perhaps, were the number of men who were present, and the interest they put into the discussions. Truly, it looked like an annual meeting of the parent association; but the part the men took in the intercourse of ideas and opinions, in clarifying the problems confronting the card room man, made the meeting one probably unprecedented in the industry, and, in its way, this gathering indicated the possibilities contained in such an assemblage. They knew what they were talking about, these men with the experience to back up what they said. Much of it was something that couldn't be gotten from books.

Undoubtedly, many of the suggestions and opinions put forth at the meeting will be used to good advantage by the chairman of the carding committee in the preparation of the questionnaire to be rendered at the next annual meeting of the association. Furthermore, the majority of those present saw the advantage of this valuable means of an interchange of ideas and pledged themselves to cooperate with their chairman in getting up this questionnaire.

If the cooperation of these men can be secured in this work, and that of the men of the other sectional committees of the association gotten in their respective lines of work, it should, beyond a doubt, make for a better and more useful Southern Textile Association, which will reflect to the good of the southern textile industry.

The Morning Session

was brought to order shortly before 11 o'clock in the parlor of the Selwyn Hotel.

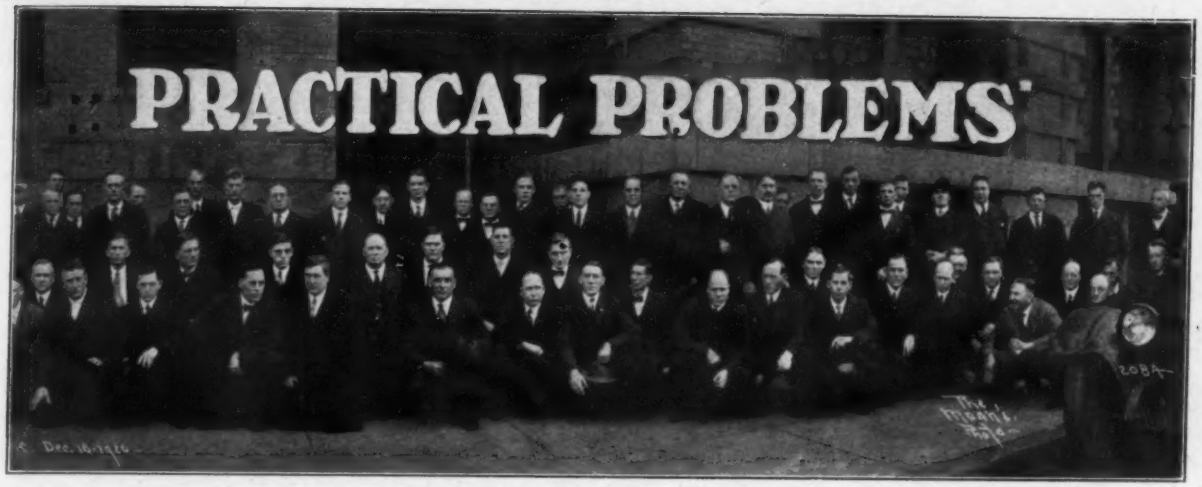
The visitors were welcomed to Charlotte by J. P. Quarles, president of the Charlotte Rotary Club, who proclaimed the men gathered at the meeting as "the men who do the work of weaving and manufacturing the cloth which clothes the world." He stated that in the task of producing good work and production, the men who have charge must be efficient and ready for service, and that with service is combined a sacrifice, that the two go hand in hand. He pointed out that while most of those assembled were from southern territory, there should be no South, no North, no East and no West; but that all should work together for the good of themselves, the country and the world.

Harry H. Boyd, president of the Southern Textile Association, was then presented to the assemblage. He called upon the men to give their earnest attention and consideration to the questionnaires which were being sent them by the chairmen of the various committees and to give authentic answers to the questions. He asked them if necessary, to make tests to determine the proper answers to the questions, and to then return the questionnaires to their chairmen according to their finding, who will in turn compile them into a general questionnaire to be submitted at the annual meeting to be held in Atlanta in the spring of 1921. He expressed it as his desire to have a copy of the findings of the different chairmen put into the hands of every member of the association.

The president then presented Marshall Dilling, superintendent of the A. M. Smyre Mfg. Co., Ranlo, N. C., and chairman of the Association's Sectional Committee on Carding, who took charge of the meeting. Mr. Dilling stated that he was indeed gratified at the interest that had been shown by the mill men in coming to the meeting.

"It looks like an annual meeting of the association," said Mr. Dilling, "and your presence here is indicative of the fact that you are interested in what is going to take place."

"We will now get down to business," he continued. "It was hoped to have a representative of the Bureau of Standards and also a representative from Lockwood, Greene & Co., present today for short addresses. We were not



able, however, to get these men."

He then asked the men to enter into the discussions that were to follow. "In the questionnaires that were sent out within the past year or two," he stated, "we have found a sort of disinclination on the part of some of the men to answer these questionnaires. But we felt that by calling the men together in this manner that we could discuss subjects among ourselves and reap much good from them. Also, the questionnaires were a one-man affair. It would be very hard for me to make up another questionnaire but with your assistance I feel that we can get up a questionnaire far superior to the previous ones. If the questions brought out today are of sufficient importance, we will put them into the questionnaire that will be sent out later. I do not want any man to feel that he is giving something away, or that he would be telling something everybody already knows. No one of us knows it all. We want it to be everybody's meeting."

The Practical Discussion.

Mr. Boyd then arose and stated that "if some one of us will start something, maybe something will get going. How many are running three processes of pickers?" Several hands went up. "How many are running two processes?" Almost as many seemed to be running two as were running three. "Now," said Mr. Boyd, "will some one who is running three processes of pickers tell us why he is doing it?"

A. T. Quantz, superintendent of the Arcade Cotton Mills, Rock Hill, S. C., said, in reply to this question: "I think you can clean better on two processes if everything is all right, but with three processes we get more uniform work."

The next question was, "How many who formerly ran three processes have changed to two processes? Why?"

A superintendent replied, "We recently put in some new pickers and cut out the intermediates and are getting just as good a lap as before. In doing this, we cut the speed of the pickers; and by so cutting the speed, we got better work. We were running the beaters at 1,050 r. p. m., and the fans at the same speed. It seemed that the breaking strength of the yarn was a little better with lower beater speed than previously."

Mr. Knowles, of Spray, N. C., said, "We were running three processes with a high speed. I had the carder put some tests through, after cutting out the intermediate, the cotton then going from the breaker to the finisher, and found that it came out just as good as before, and the yarn broke seven pounds stronger. Then we tried three processes with high speed beater and the yarn showed up weaker. This was on 22s yarn. We got better results with the two processes."

In reply to the question, "Did you run the picker speed the same on the two processes as on the three processes?," Mr. Knowles said, "We did on one test and then we cut the beater from 1,400 to 950 r. p. m. We work two grades of cotton." In reply to a question as to whether he cut the beater speed on the three processes, Mr. Knowles stated that he did not do this.

Chairman Dilling then asked, "Did you reduce the production?" The answer was that he made less beats per inch.

F. Gordon Cobb, general chairman of the sectional committee, asked what the change was in the way of waste. Mr. Knowles replied that he got more droppings from the card on two processes because the cotton was not as clean as on the three processes. He also got more droppings from the licker-in, but got less from the picker.

J. R. Wikle, Consolidated Textile Corporation, Greensboro, N. C., said that he had made some tests on three and then on two processes of pickers and had taken the laps to be tested with the standard. In the two line pickers and the three line pickers, there was no difference in the finished weight of laps. The two pickers seemed, he said, to give as fine running work as the three line method. He had not taken up the subject of waste on pickers, he stated, in reply to a question.

The next question put by Mr. Dilling was "Has anybody changed from two to three processes? If so, why?"

W. R. McGraw, of Spartanburg said, "We have a situation in which we changed from three to two processes. After doing so I found that we got good if not better results than from three processes. We also cut the speed of the beaters from 1,400 down to 800 or 900. Of course we gave the cotton less beats per inch. In the No. 2 mill we changed from three to one and on a high speed, and got better results than from three or two. I believe that when you reduce the speed you get better running spinning. In regard to waste, there is very little difference in the amount that will be thrown from the picker. But I find you get the maximum amount of waste at the card, a little more motes and perhaps more waste at the licker-in, but as a whole, I think two processes of picking is much better than three processes. Also, when you reduce the speed

you get a better breaking strength. On the other hand, we have one mill running three processes with reduced speed. When you sell the cloth in the white, three processes will beat two.

Mr. Dilling then asked, "Let's have some more information about the reduction of speed?"

B. R. Burnham, Whitney (S. C.) Mills, propounded the question, "Has not the beater speed in the past been too high, even on the old methods?" Mr. Dilling replied that almost every answer to his questionnaires had indicated that the mills replying had reduced their beater speeds, from 25 to 30 r. p. m. The newer mills were running the beaters at lower speeds than formerly, he stated.

W. H. Gibson, Jr., Union-Buffalo Mill, Union, S. C., said: "We have three processes already. We reduced the speed and still use the three processes. We are getting good results and it does not burden the cards. If you leave too much trash in the stock you will find that it burdens the card."

Mr. Pratt, Charlotte (N. C.) Mfg. Co., said: "I would like to hear about the settings on these reductions, as the setting of the beater has an effect on this process in the lap." Mr. McGraw, Spartanburg, stated that his setting was 3/16-inch and Mr. Knowles, of Spray, said his setting was 1/8-inch on the blade beater.

Mr. Dilling stated that in the questionnaires, practically everyone had recognized the necessity for cutting the speed and that the mills are reducing their beater speeds anywhere from 10 to 50 per cent. He then asked the qustion, "How many use a cleaning machine in the picker room?"

O. A. Reaves, Victor-Monaghan Mills, Arlington, S. C., said, "We are running a bale breaker and two processes of pickers, and I find that the bale breaker has helped us considerably, because we get so much cleaning with it that would have to be done further on. I think this cleans the cotton without damaging, it," he said in reply to a question from the chair.

Then several of the men entered into a discussion of the C. O. B. machine. Mr. Moore stated that he had found that with a modern cleaning process, a mill can get by with two processes of picking. J. D. Buice, superintendent of the Chadwick-Hoskins plant at Pineville, N. C., stated that after he had made some alterations on his C. O. B. machine, he found that it is worth every dollar he paid for it. This was the experience of Mr. Reaves, of Arlington. J. A. McFalls also expressed himself as in favor of the C. O. B. machine for cleaning the cotton.

Mr. Dilling then asked how many were using eveners on the pickers. He stated that some machines had an automatic feed regulator which was an evener in a sense.

In this connection Mr. Knowles, of Spray, said that he had used both English and American Creighton openers. He stated that the use of the Creighton opener enabled him to run a little lower grade of cotton.

Mr. Burnham, of Whitney, stated that at his mill they had worked out an automatic distributor by the use of which, he said, they could cut out four of their five breakers and the other one would not run over.

The chairman then asked how many had tried testing eveners by taking one lap off and then running the machine to see if the lap would be the same weight.

Mr. Moore, of Clover, S. C., said, "I have had the experience referred to. In setting the fulcrum, as I call it, we made the evener more sensitive or took the sensitiveness out of it. Then we set the evener screw for four laps and then made a lap with three. After we had done that, we ran five laps. Almost always, if you get it right with three you will get it right with five. Regarding the beaters and pickers, I am in favor of three processes of pickers. I think our speeds on the beaters should be varied in regard to the length of staple being run. I can run faster with one-inch than with 1½-inch. A plan original with me is to equip the rolls on the aprons with ball bearings. By doing this, you do not have those pauses that sometimes occur otherwise, and you do not have to run the aprons so tight, and you will find that this will pay for the bearings in about three years. You will not have to adjust the evener more than about 25 per cent as much if you adopt ball bearings for this purpose."

Mr. Dilling stated that one man had advised him that he had changed from three to two processes and had reduced the speed of the intermediate and finisher and was using both as finishers.

Mr. Becknell, of Arkwright Mills, stated that in changing from three to two processes he had put in new machines. He had six finishers and took two of the intermediates and made eight finishers instead of six. "Our speed," he said, "was formerly 1,350 r. p. m. and is now 1,050 r. p. m. We get through a 46-yard lap in eleven minutes and are getting better results with the 1,050 r. p. m. speed than we did running at 1,350 r. p. m. We are beating a little less per inch."

Before leaving the pickers to take up the subject of carding, Chairman Dilling reminded the men that if there was any question in their minds concerning the previous subject which had not been brought up and discussed, if they would write it out and send it to him, it would be given consideration in the compilation of the next questionnaire.

Carding.

When the discussion on the carding began, F. Gordon Cobb said that at the meeting held in Charlotte two weeks previously, the question was brought up "What grade of cotton is equivalent to strips?" "Many coarse goods mills," said Mr. Cobb, "are running strips and assume that they are getting about 50 per cent waste. At the previous meeting I said that strips when run through the picking and carding would make around 19 per cent waste, and those present hooted me and said that it was impossible to do that. So I have come 'loaded for bear' this time, and have present four men who have made tests along this line. Each was made in a different mill. If you care to have them do so, I should like these men to give us the results of the tests they have made in this connection."

It was stated that the waste was 6½ per cent on the original stock, which was middling to good middling cotton.

J. O. Edwards, general overseer of carding of the Lancaster (S. C.) Cotton Mills, of which Mr. Cobb is general superintendent, said that in his test he had used 100 pounds of strips, and after running this cotton through the picking and carding, he found that he still had 81¼ pounds of good stock, having had 18¾ pounds of waste.

B. L. Still, superintendent of Mills 1 and 2 at Lancaster, and B. C. Baker, assistant to the general superintendent, then reported the results of different tests they had made which further showed that strips could be run

with 18 to 19 per cent waste in the picking and carding.

Mr. Cobb then said that that was as far as they had carried out the tests at their mills, going only through the picking and carding processes. He said that in the tests, they did not figure out the amount of waste gotten in the resultant yarn. Of course, he brought out, when the waste is to be considered in determining the price of the yarn, it would have to be the total amount of waste. He said, however, that his tests were not carried far enough to ascertain this, his object being, he stated, to show conclusively that strips could be run through with an average of 18 to 19 per cent waste in picking and carding, and that those mills running strips should not "fool" themselves into believing that they get 50 per cent waste, and be governed by that opinion in selling their product.

O. A. Reaves, Arlington, S. C., said in this connection, "I have had a small mill running on waste for three years, making low grade yarns, 8s to 12s, and I find that our waste at that plant ran from 22½ to 23 per cent. This is on 1 1/16 inch staple good middling cotton. When we ran noils, however, I found that we got more waste."

The question of drafts was the next to be discussed, and Chairman Dilling asked, "How many are running a draft of 100, approximately? Two men indicated that they were. A few were running a draft of 125.

J. R. Wikle, Consolidated Textile Corporation, said that in one mill he had found a draft of 136, using a 16-ounce lap, and that the draft was changed to 108. He said that the larger draft made much more uneven work than the lower draft. There was no difference, he said, in the breaking strength of the yarn, after the change was made. The yarn, which was 22s, had a breaking strength of 74, the standard being 84.

H. D. Townsend, carder, Erlanger Cotton Mills, Lexington, N. C., said, "About a month ago I was making two weights of laps. I then decided to run all laps the same weight. I had a draft of 108; and changed to a draft of 126. I found that there was no difference in the evenness or in the breaking strength." Replying to a query, he said that the tests were made under the same humidity.

The chairman then asked the questions, "Who run about 165 on the cylinders? What is the speed of the licker-in?"

J. O. Edwards, Lancaster, S. C., said that he had had a speed of 455 r. p. m. on the licker-in and had cut it to 330 r. p. m. On two different tests, he said, he got a breaking strength, on 30s yarn, of 53.4 and 54.3. The standard is 58 to 58½. He stated that he got less droppings with the licker-in at the lower speed.

The licker-in speed can be cut down and the same web secured on the front of the card, was the opinion of W. B. Pratt, Charlotte (N. C.) Manufacturing Co., and that it would help the breaking strength to have the feed plate set close to the licker-in.

F. Gordon Cobb asked what were good settings for the feed plate to the licker-in. W. H. Gibson, Jr., Union, S. C., said that in tests he had tried from 7 to 17, and had decided on 17, making a 12-ounce lap. Another superintendent stated that he got good results from setting at 12.

O. G. Murphy, superintendent, Shawmut (Ala.) Mill, took exception to the statement of Mr. Pratt in this connection, saying "We make duck on strength, and have tried settings from 7 to 29, and are now running the bulk of our cards at 15. We had a little variation in breaking strength. Then we set the feed plate to the licker-in at 29 and reduced the variation to 20 per cent, this also make the work run more uniform. I would not run closer than 15 for anything. I tried a draft of 85 and then a draft of 100 and did not get any better breaking strength. With the licker-in set at 29 the web on the front was a little cloudy. We did not find much difference in the amount of waste. We made a 13½ ounce lap and 150 pounds production in 10 hours. The mote knives were set at 10."

Mr. Becknell, of Arkwright Mills, said, "With Howard and Bullough and the other English models of cards, you have to set the feed plates closer. I stayed in one place five years with H. & B. cards, and ran at 7. I now run at 10 on Saco-Pettee cards, and get a better looking web than at 17, and can't find any difference in breaking strength."

At 1 o'clock, following the morning session, the mill men were delightfully entertained with a luncheon in the banquet hall of the Selwyn, which was planned by the Charlotte entertainment committee in true Charlotte style. A substantial meal was served, during which the diners were entertained by a musical comedy troupe from one of the local theatres.

The Afternoon Session.

was held in the banquet hall of the hotel. There was a slightly diminished attendance, as a few of the visiting men returned home on early afternoon trains, but the interest of the morning meeting continued through this second session.

The subject of drawing was the first to be discussed at the afternoon session and Chairman Dilling asked the questions, "How many are using one process of drawing? How many use two? How many use three?"

J. J. Queen, carder at the Chadwick-Hoskins Manufacturing Co., Charlotte, stated that his mill was using three processes of drawing and the chair called upon H. H. Boyd, general superintendent of these mills, to tell why he was doing this. Mr. Boyd said, "We are using three processes of drawing, on 50s to 72s yarn. When you drop a process of drawing you drop the doublings, and I find that when you drop the doublings it makes uneven yarn. In fine yarns, you must have doublings or you will have thin places in the yarn. If I was running coarser yarns I would likely use less processes.

"In drawing cotton," he continued, "many of us think we cut the strength of the yarn in doing so. My idea is that you get extra strength in the yarn. You take the 'kinks' out of the cotton. If you draw the 'kinks' out of the cotton you get finer cotton. If the cotton is twisted with the spiral out of it, the result will be a smoother and stronger yarn, and you will get the full strength of the cotton. Drawing does not weaken the cotton; cotton will not receive the twist properly with the spiral in it. I use three processes of drawing to take the spiral out of the cotton."

"Right along this line," said Mr. Cobb, "I have made some experiments with 20s yarn and tested the doublings. I started with a doubling of 4 on the intermediates, 4 on the finishers and 6 on the second drawing. That gives a doubling of 55,296. Leaving out one process of drawing would give a doubling of only 9,216."

H. D. Townsend, Erlanger Cotton Mills, Lexington, N. C., said, "Changing from two processes to one process in our mill last summer we made some experiments on the three weights of lap, which we called light, regular and

heavy. We made the change on our cards. I have a standard of 50 pounds for laps. I started at 49½ on the light; 49½ to 50 on the regular; and 50 to 50½ on the heavy. I had the cans marked in colors; red for light; yellow for regular; and green for heavy. Our variation dropped from 4½ to about 1½ per cent and this was so good that I believed we could get through with one process of drawing. I put some stuff through one process and the breaking strength showed an increase of 4 pounds on 30s warp yarns. We continued these tests for two or three weeks and decided that it was good enough and so we cut out one process of drawing. Our front roll drawing speed was 240; we ran it that way for two months and decided it was all right. At the end of that time our weaver, who did not know that we had cut out the one drawing process, said that the weaving had run better for those eight weeks than ever before.

"I made a rearrangement of our drawing and was enabled to cut my drawing speed from 240 to 218. This made an increase in breaking strength of three pounds, making a total increase of breaking strength of seven pounds with the one process of drawing, over two processes. We formerly had a breaking strength of from 53 to 54 and now the yarn breaks around 60 pounds."

S. A. Summey, superintendent, Alexander Mfg. Co., Forest City, N. C., was one who had indicated that he was using two processes of drawing and when called on for a statement, said, "We have three picking processes and card light; two processes of drawing with a 45 grain sliver from the card. Our production per card is 78 pounds. Our front roll drawing speed is 350 r. p. m."

T. E. Stevens, general overseer, Bearskin Cotton Mills, Monroe, N. C., who also said he was using two drawing processes, said, "Using two processes of drawing, our card sliver is 48 and the finished drawing sliver about 50. The breaking strength is above 60, on hosiery yarns."

E. P. Knowles, overseer, Consolidated Textile Corporation, Shelby, N. C., said that his breaking strength was around 60 pounds and that he had a card production of 100 pounds. The front roll speed was 265 and the weight of the sliver was 50.

"What should be the real proportionate draft between the rolls?" was asked by W. W. Beckneil, superintendent Arkwright Mills, Spartanburg, S. C. G. T. King, superintendent, Dilling Cotton Mills, Kings Mountain, N. C., said that an old English rule was: 1st and 2nd, 2.56; 2nd and 3rd, 1.75; 3rd and 4th, 1.27. This would, of course, be shortened in proportion to any reduction in the hank roving.

Chairman Dilling then asked the question, "How many use a draft of less than 6?" J. A. McFalls, superintendent, Ranlo Mfg. Co., Gastonia, N. C., stated that he used a draft of less than 6, uses a low drawing speed, a low carding speed and a low licker-in speed.

Mr. King, from Kings Mountain, asked Mr. Stevens, Mr. Townsend and Mr. Knowles whether they used metallic rolls or leather-covered rolls. These three men all stated that they use metallic rolls.

Fly Frames.

Leaving the process of drawing, the meeting then went into the discussion of fly frames, and the first question asked by the chairman was, "Which gives the better breaking strength, roving with less than standard twist, or roving with more than the standard?" In the first questionnaire sent out by Mr. Dilling, the replies indicated a general inclination toward roving with less than standard twist, and in the second report of the carding committee, rendered at the Spartanburg meeting of the association, Mr. Dilling gave the results of some tests which he had conducted along this line, and which showed that the soft twisted roving gave a better breaking strength. (See page 601, June, 1920, number of COTTON.)

J. R. Dover, Jr., superintendent, Ella Mill, Shelby, N. C., said that he had reduced the roving from 160 or 170 to 140 and that in doing so the breaking strength had been increased about 4 pounds.

At this point Rogers W. Davis, southern agent, Saco-Lowell Shops, said that men of his organization had had to go to different card rooms and put in from 5 to 10 per cent more twist. This, he stated, was because of the inferior quality of last year's crop of cotton.

The chairman then asked, "What is the variation in weight of roving from a full bobbin in comparison with one half-full, or one a fourth full?"

J. R. Wikle was of the opinion that the full bobbin shows the less variation.

H. D. Townsend, Lexington, N. C., said that a bobbin one-half full will show just a little lighter than from half-full to full, because there is a little more tension from the back of the bobbin up to one-half full than afterwards.

The chairman then called upon those present to relate the worst condition in which they had ever found a card room. F. Gordon Cobb gave an interesting experience of this nature. W. H. Gibson, Jr., Union, S. C., gave it as his opinion that the greatest trouble in any card room was to get the men to apply the knowledge they already have.

F. Gordon Cobb then told of an experience he had while he was superintendent of a small mill. He said that they were having a great deal of trouble getting the cards set right and that he finally decided to ask the grinders to come for him before they put the flats on and let him put the gauges on them. As they went along, he said, he soon found that he would often be too busy at some other place to go to a card every time a grinder came for him, but that he still had them come to him and tell him that they were ready for him to look the card over. Sometimes he would go and sometimes he wouldn't. However, the result was, said Mr. Cobb, that the grinder would always set the card up right, as he never knew when the superintendent would go to look at it. Mr. Cobb stated that he had carried this system into larger mills and that it had worked with success.

Mr. Gibson, of Union, asked if anybody had tried speeding up the flats, and Mr. Townsend, of Lexington, said that he leaves his settings the same and puts on a double worm gear, and that where he had been getting out from 3 to 3¼ per cent stretch, he was able by the new method to take out 5½ per cent stretch.

This practically concluded the practical discussion, and after a unanimous expression on the success of the meeting, and the determination to hold other similar meetings of the carding section and also of the other sections, the meeting adjourned.

The David Brown Company, Lawrence, Mass., manufacturers of bobbins, spools and skewers, are sending out a calendar for 1921 showing a view of their plant as well as a gold medal exhibit of their products.

SOUTHERN MILL CONSTRUCTION AND ADDITIONS IN 1920

WINNSBORO MILLS, WINNSBORO, S. C.

Nineteen-twenty saw the completion of quite a number of new mills and additions in the southern section of the country, some of which were started in 1919. In the following pages we have tried to call attention to the details of a few of the more striking specimens as well as to include as nearly a complete list as possible of the more important additions. Only a lack of space prevents the use of a much larger number of photographs.

At the top of this page is shown the complete new cotton mill of the Winnsboro Mills, at Winnsboro, S. C. This mill was designed to manufacture goods for the rubber trade. It has 296,000 square feet of floor space and is completely equipped with elevators, conveyor systems, heating, humidifying, plumbing, and lighting systems as well as automatic sprinklers, power wiring and motors.

The building is a reinforced concrete skeleton of flat slab type, three stories high and with basement under half the first floor. There are 25 bays totaling 708 feet in length and 4 bays totaling 116 feet in the width. There are two expansion joints in the length; two stair towers with toilets and one elevator tower. Steel sash was used and the curtain walls, cornice and architectural trim is in concrete.

The mill has a conveyor system which, briefly, consists of a conveyor pipe from the opening room into the picker room in the basement, thence, to the card room on the top floor by an Otis freight elevator. Roving is carried from the card room to the spinning room on the second floor by spiral chutes and empty boxes are returned by continuous inclined elevators; thence to the machines by truck. A monorail system on the second floor handles beams to storage whence they are taken on trucks, via freight elevator, to the first floor storage and twister room. The spooled product is then taken to the basement in boxes by spiral chute and thence by belt conveyor through a tunnel to the weave shed; empty bobbins are returned on the bottom of the belt conveyor through the tunnel and to first floor by a vertical lift elevator.

The humidifying was done by the Carrier Engineering Company whose system provides for heating in winter and cooling in summer.

Lighting is of the 110-220 type with 1283 outlets, conduits being inclosed in the concrete work. Glass top R. L. M. standard dome reflectors are used. 150 watt units. Each floor is controlled by three panel boards.

The machinery arrangement is pickers in the basement, card room on third floor, spinning, spooling and warping on second floor, twisting on first floor. Opening and weaving being done in the old mill.

This mill was designed and supervised by Lockwood, Greene & Co., engineers, Atlanta office. Built by the Southern Ferro Concrete Company of Atlanta, Ga.

Durham Hosiery Mills.

The Marvin Carr Building, of the Durham Hosiery Mills, Durham, N. C., was designed for the manufacture of "Durable Durham" silk hosiery. The building is 226 feet long by 116½ feet wide, five stories high, and is built of reinforced concrete, flat slab construction. The floor slabs are 11 inches thick and are finished with a 1-inch thickness of hard cement. The roof slab is 10 inches thick, covered with five ply tar and gravel. The columns are of mushroom type and are 28 inches in diameter on first and second floor; 24 inches on third and fourth floors, and 22 inches on fifth floor. They are spaced on 22 foot centers longitudinally and on 28 foot centers across the building. Story heights are 15 feet from top to top of floors. Walls are of concrete with ornamental brick veneer panels. Sash are steel.

Tests were made on the finished floors to determine the actual carrying capacity for both live and dead loads.

Four adjacent panels were gradually loaded by the application of bags of sand. Deflection readings indicated the rigidity of the slab, extensometer readings indicated the stresses in the steel. The results of the tests showed a factor of safety of 7, the calculated factor being 4. The floors were designed for a live load of 125 lbs. per square foot, and the actual load applied was in excess of this.

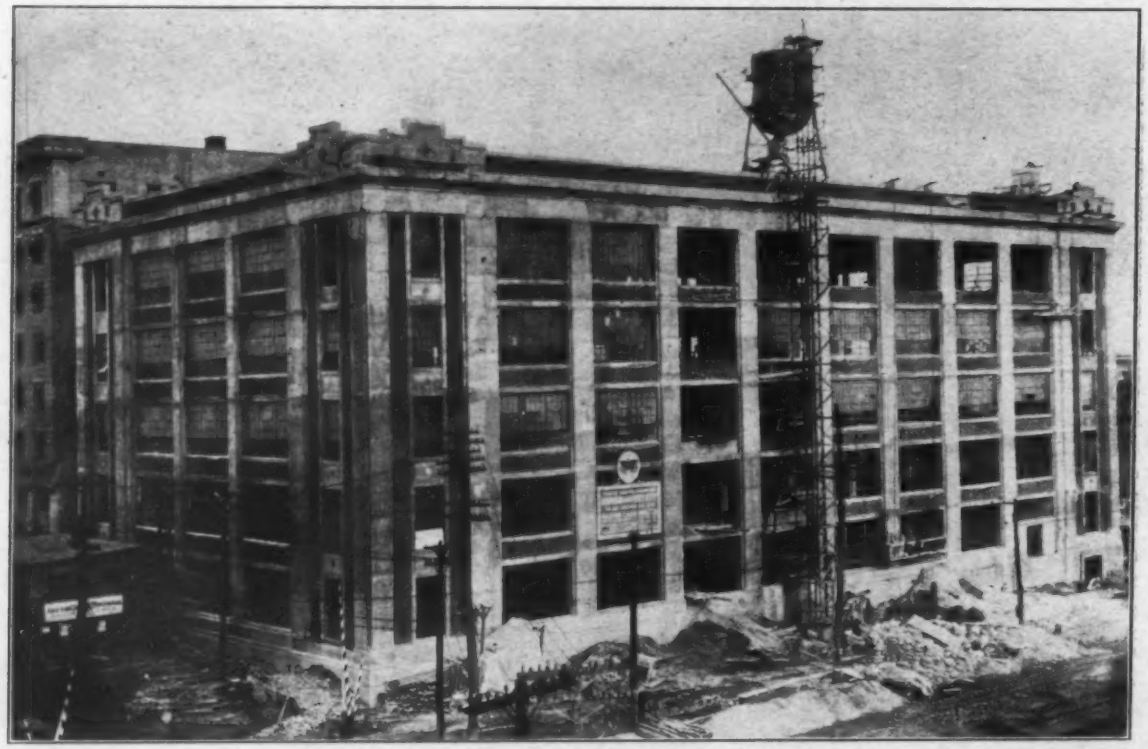
The Carrier system of heating and air conditioning is used. A boiler room with two 100 hp. boilers in the basement supplies the necessary steam. The air is washed and purified and at the same time moisture is added, the amount of moisture being automatically controlled. In the summer, air is drawn directly from the outside, but in the winter the air throughout the building can be washed and used again, effecting a considerable saving in heat. The air is forced through a vertical concrete shaft to the different floors by means of a fan and distributed through galvanized iron ducts running the length of the building. Heat is supplied to the air by a heating coil installed in the steel duct of each floor. The system will give a complete change of air in 15 minutes, except that where special cooling is desired, as in the boarding room, it can be changed in 5 minutes.

The power and lighting wires are installed in a wire shaft extending through all floors. All connections to floor feeders will be installed in this shaft. The machinery equipment will be driven by individual and small group motors.

An indirect lighting system with Holophane white enameled steel reflectors and lamps of 500 to 1000 watts will be used throughout the building. Where color values are required, as where matching is done, Nela Trutint units, with 500 watt lamps will be used to approximate daylight conditions.

Three high speed Otis passenger elevators, having a capacity of 30 people each, are capable of emptying the building of all employees in twelve minutes. A freight elevator is located conveniently for all incoming and outgoing freight. Shipping by both railroad and truck is provided for.

The arrangement of machinery and the method of handling the stock in process of manufacture is as follows. The raw silk and general storage with opener and shipping rooms are on the first floor. The matching of hosiery will be done on the second floor. The black and grey storage, the paper box shop and the boarding rooms are on the third floor. The knitting machines will be located on the fourth and fifth floors and the looping machines are also on the fourth floor.



MARVIN CARR BUILDING OF THE DURHAM HOSIERY MILLS, DURHAM, N. C., WHERE SILK HOSE WILL BE MANUFACTURED.

The building is located in the business section of Durham and the operatives will be recruited from the city. In the design and equipment of the building the safety and comfort of the employees has been an important consideration. A portion of the first floor of the building is used exclusively for recreation and diversion. A fully equipped cafeteria has a capacity sufficient to serve 450 people. A general lounging room 50 feet by 70 feet adjoins the cafeteria and is separated by accordion doors. Rooms equipped with steel lockers and shower baths are provided for men and women. Toilets with modern plumbing are on all floors.

Cold drinking water is provided from an Audiffron refrigerating system to three drinking fountains on each floor and connections are made to the cafeteria and loung-

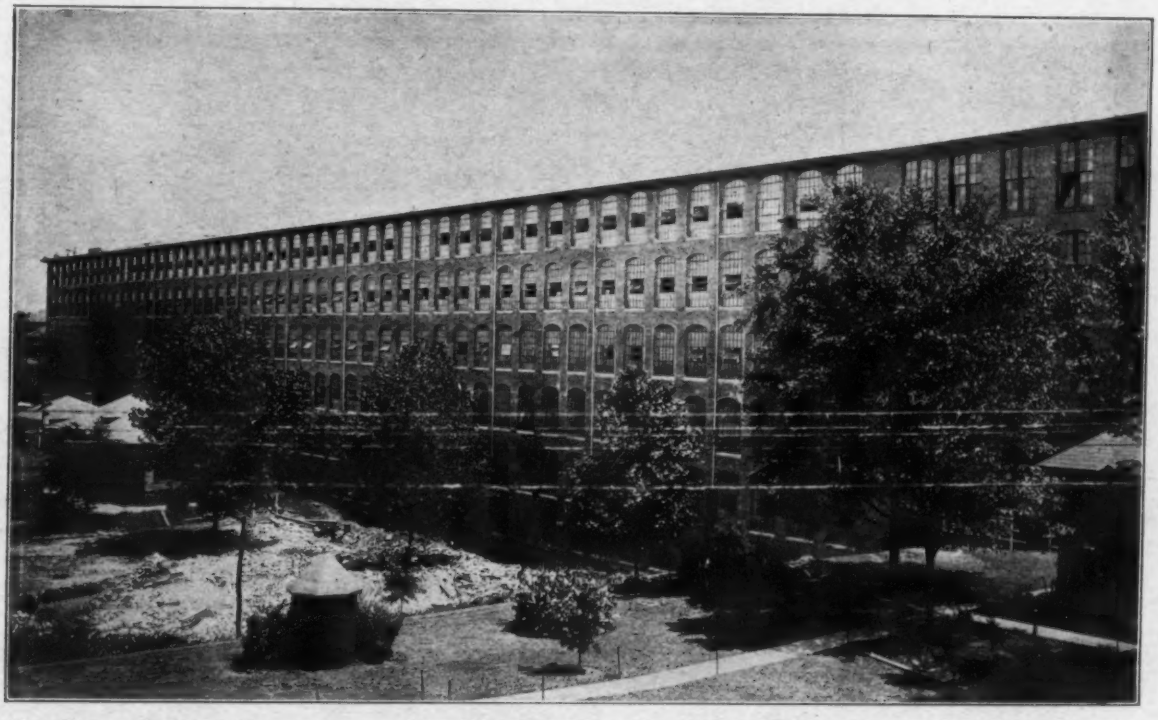
ing room. The building is completely protected against fire by sprinklers and with wire glass on all exposed sides in accordance with the requirements of the Factory Insurance Association.

The building was designed by J. E. Sirrine & Company, Engineers, Greenville, S. C., and New York. The construction is by Aberthaw Construction Company, New York and Atlanta. The air conditioning and heating system was designed and installed by the Carrier Engineering Corporation, New York. The electrical apparatus is of the General Electric Company's make. Tucker & Laxton, Charlotte, N. C., are the electrical contractors. Fenestra sash is used in window construction. The knitting machines are the latest automatic type manufactured by Scott & Williams. The design and construction were carried out under the supervision of T. C. Atwood, chief engineer of the Durham Hosiery Mills.

when the present mill was doubled, making the new plant some 1200 feet long—five stories and basement.

On account of the extreme length of this plant very careful study was given the processes of manufacture and every detail has been worked out to keep the haulage to a minimum and the process in progression. High speed, automatic elevators and conveyors have been provided to move the enormous production of this plant and from the cotton warehouse, throughout the mill and into the weave shed and cloth room, the product moves in a straight line of operation.

The new work just completed comprises the 600 foot extension to the present mill, an enormous weave shed—210 feet wide by 615 feet long—a new boiler plant unit of 500-hp., a large transformer building, and the layout of a beautiful village with some 150 attractive new houses, a graded school building, a day nursery and natatorium.



ONE END OF SPINNING DIVISION OF THE BIBB MANUFACTURING CO., COLUMBUS (GA.) PLANT. THE WIDE PILASTER BEHIND THE TREE AT THE RIGHT OF THE PHOTO SHOWS WHERE THE NEW EXTENSION ENDS; IT IS ALSO A HALF-WAY MARK IN THE LENGTH OF THE MILL. THE NEW SAWTOOTH WEAVING SHED IS ON THE OPPOSITE SIDE OF THE MAIN MILL FROM WHERE THE CAMERA STOOD.

Columbus, Ga., Plant—Bibb Mfg. Co.

The completion of the new addition to the Bibb Mill at Columbus gives to the South, not only the largest, but one of the most complete textile units in America. Standing as a great monument to the textile industry in the South this immense plant gives honor to the Bibb Mfg. Company who are doing so much to raise the standard of textile manufacture in this section.

This new plant, operating as a single unit, in one building, contains some 112,000 spindles and 1,250,000 sq. feet of floor area, making it one of the largest mills under one roof in this country.

The history of this plant dates back to 1900 when the original mill was built, it being 5-stories, some 300 feet long and 135 ft. wide. In 1917 the original plant was doubled and its progress and growth culminated in 1919,

The new mill addition embodies the same general design as the original mill. However, to secure as much light as possible, special Fenestra steel sash and cast iron columns were used throughout. Careful study was given to the layout of the lavatories, which are faced with enameled brick. Ceramic tile, and individual flushometer fixtures were used throughout. A complete system of water cooling is used to provide ice water throughout the plant.

The south elevation is accentuated by slender elevator towers, spaced symmetrically, while the main facade terminates in an immense double entrance tower, which gives the whole design a very pleasing effect. Acting as a vestibule to this double entrance tower is an attractive loggia which gives an unusual amount of architectural character to the building. Landscape architects have been employed to study the layout of walks and planting of shrubbery

around this loggia and when completed, it will furnish a very attractive approach to the mill.

Flanking the mill on the south is the new weave shed. The new shed is of the saw-tooth type and every desirable feature possible has been provided to make this the most pleasant workroom in the whole plant. A Carrier system of heating, humidifying and ventilation has been installed which provides a circulation of cool washed air at an even temperature at all times. Numerous concrete tunnels under the floor bring the air into the room from a central station which is located in a separate building near the center of the shed. The weave room is intercommunicating with the main mill through an underground tunnel which is some 60 feet in length. On account of different floor levels, double automatic elevators are used to carry the work into the weave room.

The mill is completely electrified in a most modern manner. Current is supplied by the Columbus Power Co. from their North Highlands Station which is located within a stone's throw of the west end of the plant. The 11,000 volt transmission line connecting this station and the one at Goat Rock runs directly into the substation building constructed by the mill and is stepped down to the various required voltages. All the motors in the mill are operated at 550 volts, the village lighting is 2300 volts and the lighting for the mill proper is 230 volts, 3 wire with 110 volt lamps. These various service lines radiate from the substation, which is described in more detail further on.

The motor drives have been laid out with a view to eliminating as much belting and shafting as possible and still maintaining a flexible drive. The pickers are driven from individual motors located on "A" frames, the cards are grouped, the balance of the preparatory machinery including drawing frames, roving frames and combers are driven by four frame motors. The spinning frames and the twisters are also driven in groups of four while some twisters have one motor for each pair of twisters. The looms are equipped with individual motors which are totally enclosed. Most of the miscellaneous machinery is individually driven. With the exception of the cards, the only belts retained are those between the motor and machine pulleys. All motors were furnished by the General Electric Company.

The artificial lighting of the mill is as follows: Mazda "C" lamps of 150 watts each are used in R. L. M. dome type reflectors in most departments. The arrangement of lights being based on a modified system of general illumination to give about 5 foot candles intensity for the spinning and weaving and about 4.5 foot candles for the carding and picking. A complete circuit for attachment plugs has been provided to permit the use of small portable motor driven tools, air compressors or electric floor scrubbers.

The wiring for both power and lighting is of a high standard. All motors and switches are provided with terminal boxes, all wiring is in conduit, all lamp drops have flexible steel covering so that nowhere in the mill is any wire exposed. The mains are brought into panel boards placed in steel boxes provided with locks. On these boards the mains are broken up into the smaller circuits. The future extension of feeders has been provided for in the arrangement of these panel boards. All the wiring and installation work was done by the J. M. Clayton Co., of Atlanta.

GIRLS' DORMITORY, BIBB MFG. CO., COLUMBUS (GEORGIA) PLANT. ROBERT & COMPANY, ATLANTA, ENGINEERS.

All the houses in the mill village are electric lighted and an adequate system of street lights has been provided.

The substation building controlling the complete electric service is worthy of special mention. It is entirely separate from the mill buildings proper and consists of a brick building with steel sash having concrete foundation and roof. It is used for housing the switching and miscellaneous equipment and of an outdoor transformer pad of concrete with a steel superstructure for carrying the wiring and buses.

The 11,000 volt line enters the side of the switchboard building and a tap is taken off through a disconnecting switch to an electrolytic lighting arrester. The main line passes through a high tension lighting and a high tension power breaker from which the separate lines pass through the end of the building and onto the transformer frame.

87% of all buildings erected by Turner Construction Co. during 16 years are covered with Barrett Specification Roofs—

IF experience in constructing permanent buildings counts for anything, the great Turner Construction Company of New oYrk, builders of the vast Concrete "Cities" picture dhere, should *know* how to select a *permanent* roof.

The figures quoted tell their own story. This great construction company, the 270 owners for whom they erected these 519 concrete buildings, and the 94 prominent architects and engineers, united in choosing Barrett Specification Roofs for over 87% of the total roof area.

Could there be more exclusive proof than this of the durability, economy and general supriority of these roofs?

The Surety Bond Guarantee

Yet the owner of a Barrett Specification Roof need not rely upon even this practically unanimous judgment of experts. He is absolutely insured against all roof trouble and upkeep expense by a surety bond of one of the strongest surety companies in America—The U. S. Fidelity and Guaranty Co. of Baltimore.

Before specifying or closing contract for a Barrett Specification Bonded Roof, be sure to read carefully all the stipulations in the Specification.

The Barrett Specification Type "AA" 20-Year Bonded Roof represents the most permanent roof covering it is possible to construct, and while we bond it for twenty years only, we can name many roofs of this type that have been in service over forty years and are still in good condition.

Where the building does not justify a roof of such extreme length of service, we recommend the Barrett Specification Type "A" Roof bonded for ten years. Both roofs are built of the same high-grade materials, the only difference being in the quantity used.

TURNER CONSTRUCTION COMPANY

New York

Oct. 10th, 1919.

THE BARRETT COMPANY, New York.

Herewith are the five composite drawings made to scale and showing truthfully all the reinforced concrete industrial buildings erected by our Company in the seventeen years from 1902 to December 31st, 1918, both inclusive.

It will interest you to know that the roofs of all these Five Hundred and Nineteen Buildings have a total area of 8,642,818 square feet, of which approximately 7,571,108 square feet, or 87.6 per cent., were covered with Barrett Specification Roofs. In reality, therefore, these Turner Cities, as these drawings are known, make most excellent Barrett Cities. The use of Barrett Specification roofing as you know has been practically a standard with us for years.

On these 519 buildings, the total cost of which would exceed Ninety Millions of Dollars, we have dealt with 94 prominent Architects and Engineers and 270 different Owners.

These Cities are not only an excellent endorsement for "Turner for Concrete," but they are, it seems to us, an exceptional indication of the general merit of Barrett Specification Roofs.

Very truly yours,

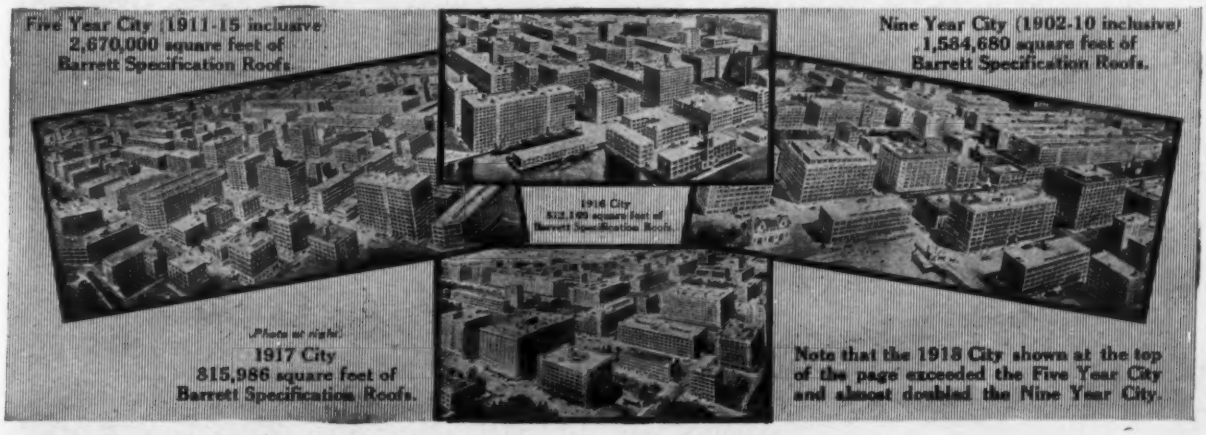
JPH/VES Vice-President.

Full details regarding these Bonded Roofs and copies of The Barrett Specifications sent free on request.

The Barrett Company

New York	Chicago	Philadelphia	Boston
St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	New Orleans	Birmingham	Kansas City
Minneapolis	Dallas	Nashville	Syracuse
Salt Lake City	Seattle	Peoria	Atlanta
Duluth	Milwaukee	Bangor	Washington
Johnstown	Lebanon	Youngstown	Toledo
Columbus	Richmond	Latrobe	Bethlehem
Elizabeth	Buffalo	Baltimore	Omaha
Houston	Denver	Jacksonville	

THE BARRETT COMPANY, Limited:
Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S.


Five Year City (1911-15 inclusive)
2,670,000 square feet of
Barrett Specification Roofs.
1916 City
Nine Year City (1902-10 inclusive)
1,584,680 square feet of
Barrett Specification Roofs.
Photo at right:
1917 City
815,986 square feet of
Barrett Specification Roofs.
Note that the 1918 City shown at the top of the page exceeded the Five Year City and almost doubled the Nine Year City.

All 11,000 volt equipment is concentrated on one side of the station and cut off by a grille work from the low tension.

The transformer equipment consists of 3 150 kva self-cooled lighting transformers, with a fourth as spare, stepping down to 230 volts and 3 1250 kva power transformers with a spare of the same capacity stepping down to 575 volts. The low tension circuits are carried back onto the building on the side opposite to the 11,000 volt equipment and broken up on switchboards. The power section and the lighting section of the board are separated, the village lighting street series and constant current transformer panels are located with the mill lighting board.

From the circuit breakers the mains drop into a concrete tunnel below the switchboard which is large enough to allow the wires to be neatly arranged. This wire tunnel will be of great value when any work has to be done on the wiring. The mains pass out of the tunnel through the concrete foundation and fall out underground in a parkway cable running to the various entrance points to the mill buildings.

The substation has a transformer pit to facilitate the repair of damaged transformers and is served by a hand power crane large enough to handle the heaviest piece of equipment.

It is necessary to maintain a power factor of 90 degrees on the outgoing lines. The normal cotton mill power factor is 80 degrees, or below so in the station a 1500 kva synchronious condenser has been provided which is floated on the line to supply the necessary increase in power factor.

The entire plant was designed and supervised by Robert & Company, architects and engineers, Atlanta, Georgia, and the building construction work was done by T. C. Thompson & Bros., contractors, Charlotte, N. C.

Holston Manufacturing Co.

Holston Manufacturing Company, Knoxville, Tenn., is a new mill for making 2,000 dozen pairs of hose per day. 72,900 square feet of floor space; includes knitting mill, dye house and boiler house. A village was also provided.

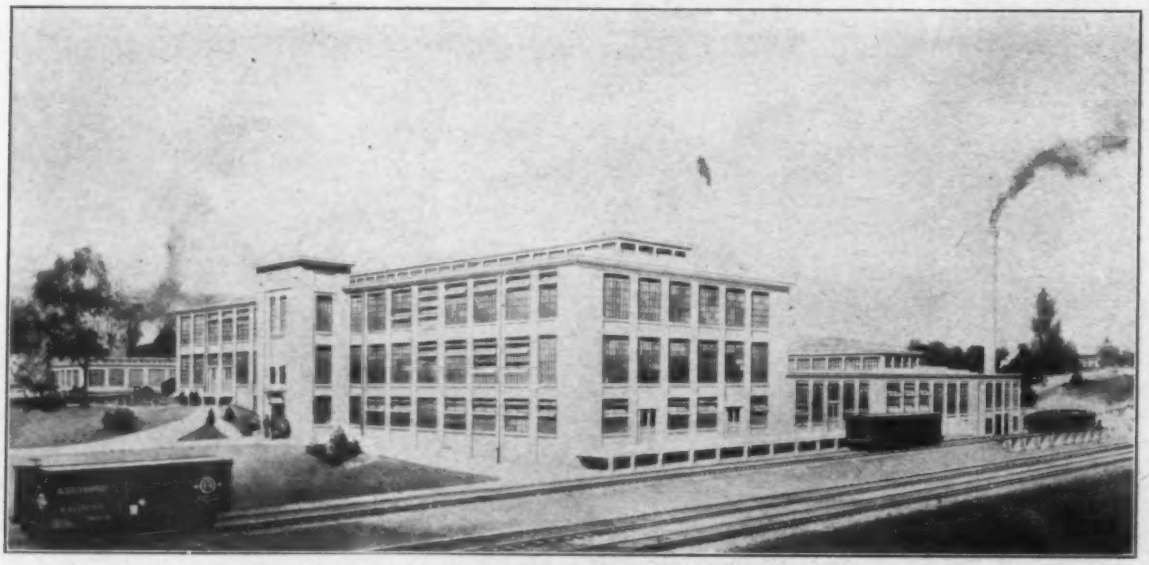
The plant consists of a knitting mill, two stories and basement, 102 feet wide, 210 feet long, walls of reinforced concrete, interior columns of cast iron, beams of structural steel with wood floors, complete frame roof and monitor. steel sash in side walls, one toilet and elevator tower and one stair tower.

Dye and boiler houses connected and are one story high, the former being 102 by 210 feet and latter 45 by 42 feet, same type of construction as the mill. Connecting the mill and dye house is a mixing room for the chemicals used in dyeing.

For lighting, 361 outlets are used on a 110-220 type system, 100 watt lamps in general, with R. L. M. standard dome reflectors; a special arrangement is used for hosiery machines.

Heating is supplied by standard American wall radiation, two pipe vacuum system, with about 11,000 square feet of radiation.

The plant is so arranged that the yarn arrives in the basement, is elevated to the top floor. Then goes to the ribbers, footers and loopers. The gray hose proceed by chute to basement, then to dye house where all are dyed black, then back to basement, elevated to first floor; packed and shipped.



HOLSTON MANUFACTURING COMPANY, KNOXVILLE, TENN.

The design of the plant and the supervision of erection was by Lockwood, Greene & Company, engineers, Atlanta office. Construction was by Aberthaw Construction Company, Atlanta, Ga.

Langdale Mills, West Point Mfg. Co., Langdale, Alabama.—In increasing their present plant from 18,000 to 35,000 spindles the Langdale Mills are just completing a large extension to their plant. The extension was in the nature of an addition to the present mill, 268 feet long. A detached picker room and machine shop was also built, the building being 168 feet long, 72 feet wide, two stories. In addition to these there is a one-story extension from the main mill 372 feet long which is used for cloth storage and warehouse. The main facade of the mill is accented by several new entrance towers, which give a very pleasing effect to the complete mill. This new development makes

Langdale a complete unit of 35,000 spindles, operating in conjunction with the other plants of the Wellington-Sears interests around West Point. Robert & Company, Atlanta, were the engineers and the work was done by the West Point Iron Works of West Point, Ga., as contractors.

Thatcher Spinning Company, Mill No. 2.

The new cotton spinning plant of the Thatcher Spinning Company, Chattanooga, Tenn., is practically a duplicate of the plant designed and built in 1916, except that it is about fifty per cent larger than the latter. The mill manufactures fine combed hosiery yarns from long staple cotton. The main mill building is a three-story structure of reinforced concrete 309½ feet long and 133 feet wide with a small basement which forms the dust room for the picking machinery.

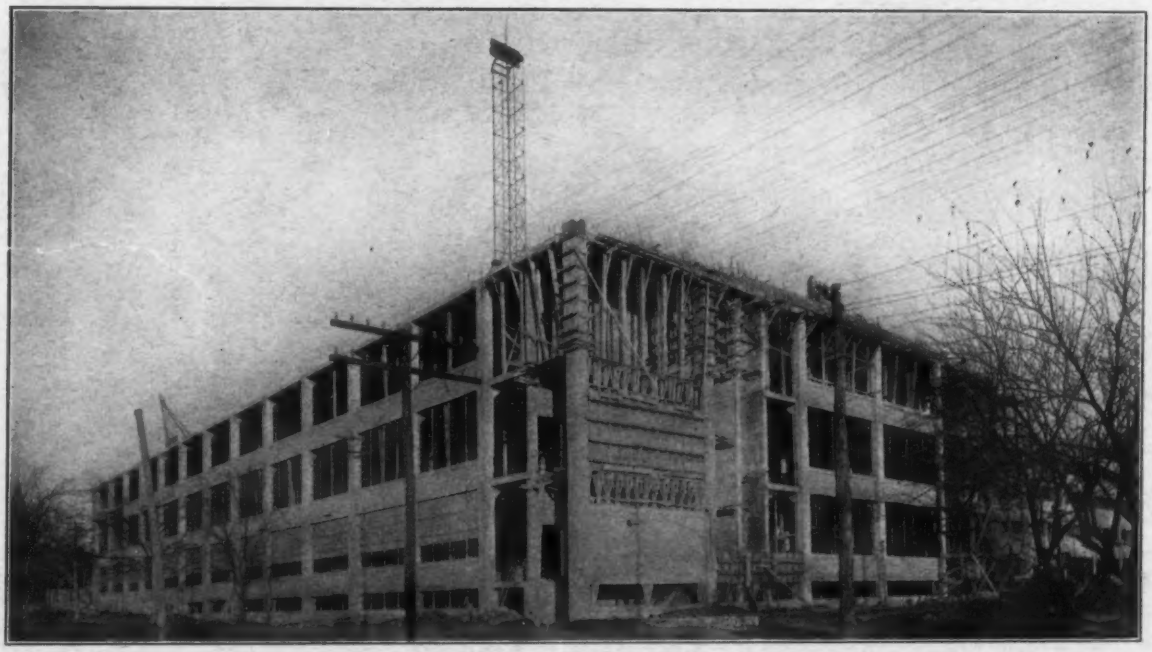
The floors and roof are of flat slab construction. The walls and pilasters are of reinforced concrete and with the steel sash provide a maximum area for natural lighting openings. The corner towers are finished with brick veneer panels which add considerably to the appearance of the building. The floor slabs, which are 9½ inches thick, are covered with a layer of 1½ inch tarred sand on which a 2 inch sub-floor and a finished floor of 1 inch maple are laid. The roof slab is covered with a standard five ply tar and gravel roof. Large skylights in the roof provide additional light and ventilation. The bays are 22 feet wide and the divisions are 26 feet wide. Mushroom columns on all floors have a diameter of 20 inches.

A cotton storage building adjoins the main mill building and is also of flat reinforced construction. It is four stories high, 115 feet long and 62 feet wide. A part of the first floor is occupied by the opener room. This section has a ceiling height of 17 feet 3 inches. The remaining part of the first floor and all other floors have a ceiling height of 9 feet. Baled cotton is carried from floor to floor by a simple elevator equipment.

In the main mill the Parks-Cramer humidifier system with high duty heads and automatic control is installed. Fire protection is provided for with automatic sprinklers, together with the regular complement of outside hydrants in hose houses. Water for the fire protection system is supplied primarily by a 75,000 gallon tank on a steel tower mounted above the toilet tower. Connections with the city water system furnish the secondary source of supply.

The cotton opened in the first floor of the storage building is blown to the picker room on the top floor. From this room the laps are carried to the card room on the same floor. In this room it goes through the carding, combing and roving processes. The roving is carried from this top or third floor by an elevator to the second floor, which is completely occupied by the spinning process. From the spinning room the cotton is carried in the elevator to the first floor, which contains the spooling, twisting, warping and shipping departments.

Individual motors are used for driving all machinery with the exception of the cards and roving frames which are driven by small group motors. Transmission from the motor shafts to the driven shafts on spinning frames, comb-



THATCHER SPINNING COMPANY, CHATTANOOGA, TENN.. 32,540 SPINDLES ON COMBED YARNS FOR FINE HOSIERY MANUFACTURE.

ers, spoolers and twisters, is done by means of silent chains. The roving frames are driven by a 4-frame drive motors running at a full load speed of approximately 700 r. p. m. This slow speed motor allows the use of a reasonably large motor pulley so necessary on drives of this type. Each line shaft in the card room is driven through a silent chain by a moderate size motor.

The lighting system is direct, using 200 watt bowl enameled lamps and R. L. M. white enameled reflectors suspended by conduit, so as to give a mounting height of approximately 14 feet above the floor. An automatic voltage regulator maintains constant voltage on the lighting system.

The engineering work for the complete plant was prepared and supervised by J. E. Sirrine & Company, Greenville, S. C. and New York City. The Turner Construction

Company, of New York and Atlanta, were the general building contractors. The picker room machinery was made by the Saco-Lowell Shops and practically all of the textile machinery by the Whitin Machine Works. The electrical equipment was furnished by the Westinghouse Electric & Manufacturing Company and the chain drives by the Link-Belt Company. The Chattanooga Railway & Light Company are furnishing power to the plant and this company also is the contractor for the electrical installation.

P. H. Hanes Knitting Company, Winston-Salem, N. C. —New dye house, 6 stories and basement for underwear manufacture. 136,700 square feet of floor space. Includes elevators, sprinklers, tank, heating, ventilating, plumbing and lighting. Building is reinforced concrete skeleton, flat slab type, 20 feet by 20 feet—curtain walls of concrete, architectural treatment in concrete. Lockwood, Greene & Co., engineers.

Miller Cotton Mills, Waco, Texas.—Complete mill and dye house for manufacturing cotton into overalls. Mill has 72,200 square feet of floor space and includes elevator, heating, humidifying, lighting, plumbing, sprinklers; dye house has 12,535 square feet of floor space and includes lighting, heating, plumbing and sprinklers. Both buildings are reinforced concrete skeleton, flat slab for mill on 20 foot square bays, and beam and girder and slab type for dye house; architectural trim of concrete; curtain walls of brick in dye house and of concrete in mill. Mill 3 stories and basement; dye house one story. Lockwood, Greene & Co., engineers.

Payne Mill, Bibb Mfg. Co., Macon, Georgia.—This was an extension to the present plant, increasing the spindles from 10,000 to 20,000. The new addition was interesting, in that the entire side wall of the old plant was taken out and the width of the mill increased 75 feet. The mill is now 150 feet wide by 534 long, with a 50 foot monitor extending the full width. Three new units of warehouses were also built together with a new system of concrete platforms. The engineering work was done by Robert & Company, Atlanta, Ga.

Marlboro Cotton Mills, McCall, South Carolina.—An extension to the No. 6 Mill, 281 feet by 75 feet. The addition to be used as a weave room and cloth room. Steel sash and cast iron columns were used. Robert & Company, Atlanta, Ga., were the engineers.

Southern Spring Bed Company, Atlanta, Ga.—For manufacture of metal beds, springs and mattresses, 60,900 square feet; includes elevator, sprinklers, heating, lighting, power wiring, plumbing and provision for two additional stories. Building is flat slab, skeleton concrete type 20 foot square bays two stories high. Lockwood, Greene & Co., engineers.

The New Citadel: South Carolina Military Inst., Charleston, S. C.—Barracks building 64,000 square feet floor area. Three stories and basement built for a dormitory in the shape of a hollow square; the walk stuccoed; wood floors and roof, reinforced concrete tower. Administration building, dining hall, and power house under construction. Lockwood, Greene & Co., engineers, Atlanta, Ga.

COLUMBUS MANUFACTURING COMPANY, COLUMBUS, GA.

Weave shed for making 40 to 60 inch sheeting. Contains 76,816 square feet of floor area and includes heating, humidifying, lighting, plumbing, power wiring and motors, sprinklers. Building is one story and 6' basement, (not included in area) reinforced concrete, beam and girder type 24' square bays, saw tooth roof. Lockwood, Greene & Co., Engineers, Atlanta, Ga.

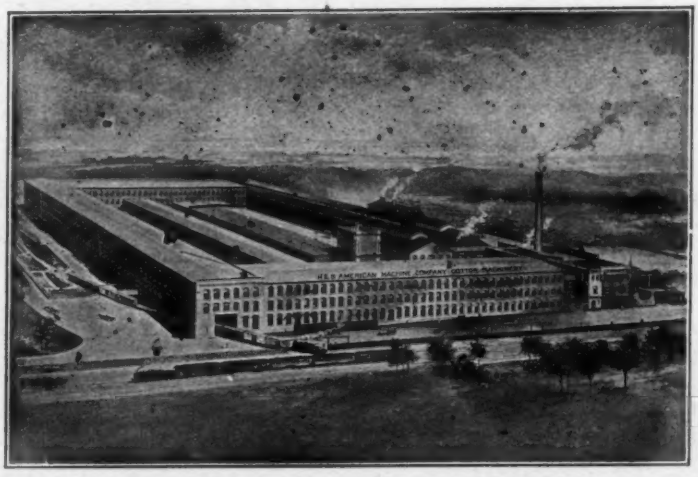
C. E. RILEY, Pres.
Boston Office
161 Devonshire Street

Southern Office
Atlanta Trust Co. Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

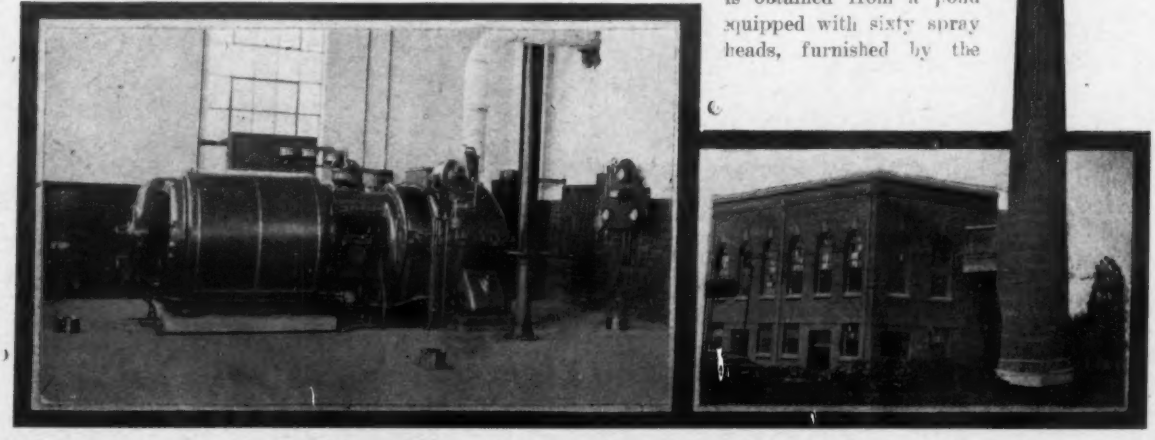
H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Stonewall Cotton Mills.

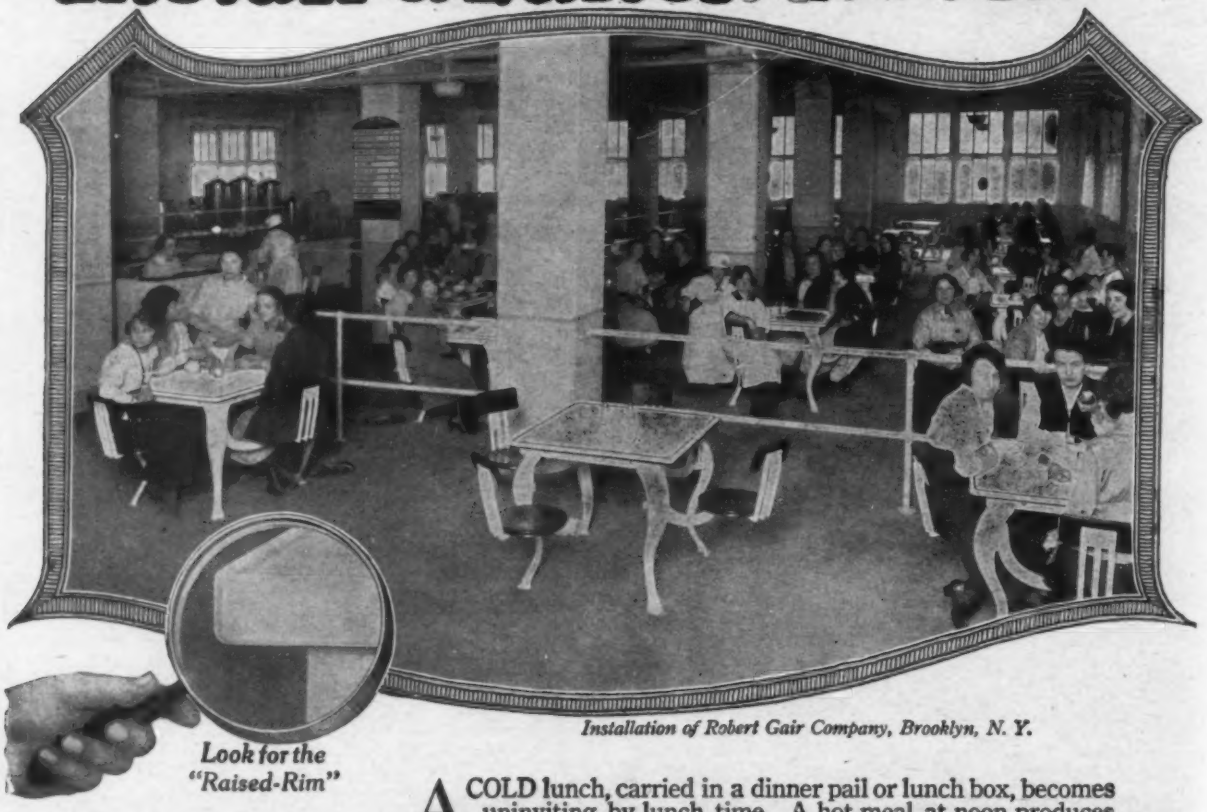
Mills No. 1 and 2 of the Stonewall Cotton Mills have for a number of years been driven by separate steam power plants containing reciprocating engines. Mechanical transmission was used from the engines to the machinery. When it was decided by the management to install an economical central station, electric drive was chosen for the transmission system and a steam turbo-generator unit adopted as a main power unit.

The new power station consists of a brick building containing a turbine room 46 feet by 28 feet and a boiler room 65 feet by 34 feet installed between the two mills and near the dye plant. The main power unit is a 1000 kw. steam turbo-generator with extraction features and operating condensing. Steam at 200 lbs. pressure and approximately 40 degrees superheat is supplied from the battery of five 250 hp. boilers, one of which is normally used as a spare. Steam from the extraction valve of the turbine is delivered to the dye house at approximately 15 lbs. gauge pressure and is used for heating the dye house equipment. Exhaust steam from the turbine is carried to a low level jet condenser, which is driven by a small steam turbine. Cool water for this condenser is obtained from a pond equipped with sixty spray heads, furnished by the



NEW CENTRAL POWER PLANT AT THE STONEWALL COTTON MILLS, STONEWALL, MISS., AND THE 1000 K W EXTRACTION TYPE TURBO-GENERATOR IT CONTAINS.

If You Want Efficiency Install a Lunch Room



Installation of Robert Gair Company, Brooklyn, N. Y.

Look for the "Raised-Rim"

—healthier workers

—less labor turnover

—buy permanent equipment

A COLD lunch, carried in a dinner pail or lunch box, becomes uninviting by lunch time. A hot meal at noon produces energy and promotes efficiency and industrial contentment. You can serve a hot meal in your plant at a minimum cost by installing a ***Sani*** lunch room.

The U. S. Department of labor estimates that it costs $500.00 to train the average employee for permanency. Why not save this money? A ***Sani*** lunch room in your plant will reduce the labor turnover and your employees will not want to move from one plant to another.

Sani-Onyx table tops are *radiantly-white*, durable, easy to clean and as hard and smooth as polished glass. The *"Raised-Rim"* (our exclusive patent) prevents chipping and dripping. ***Sani-Metal*** table bases are made of fine-grained cast iron, heavily coated with porcelain enamel. No projections or crevices for dirt to collect.

Write In Today

We will send you our latest catalogue showing all kinds of ***Sani*** food and drink equipment. This beautiful book contains valuable information and many illustrations. Send us your floor plan and our engineering department will lay out your space free of charge.

These materials may be purchased from local distributors. Our export department completely equipped to handle foreign business.

Sani Products Co.

669 Sani Building, Chicago, Ill.

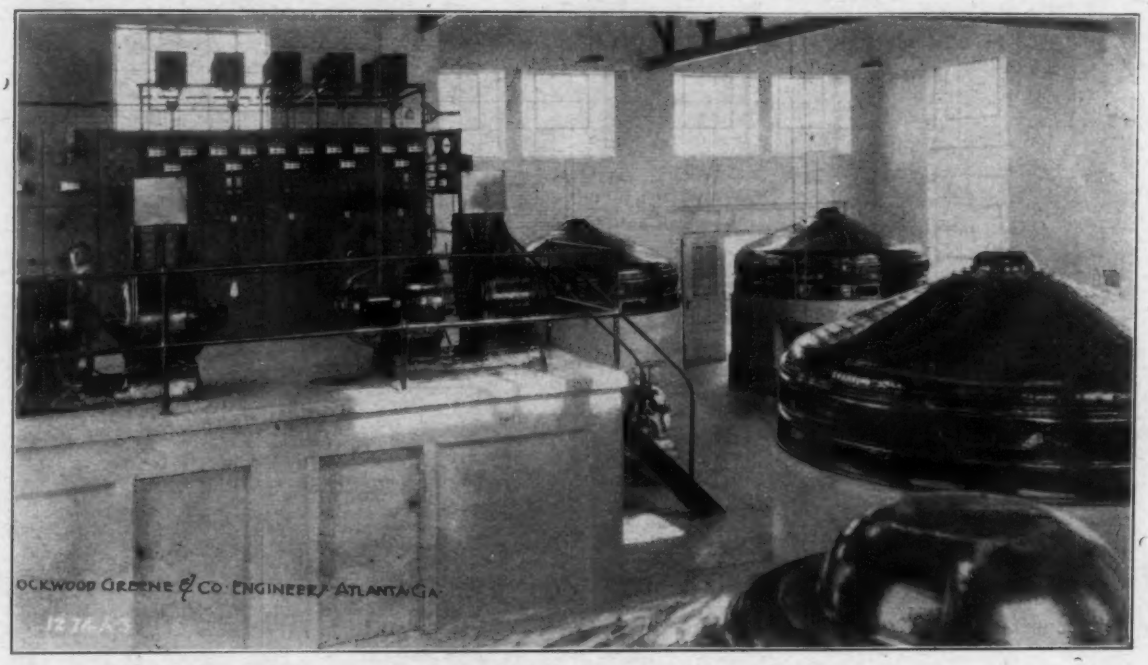
Sprague Engineering Company. A motor generator set and a steam turbo driven generator set are provided for excitation, the latter being used for starting up only.

The mills are driven by small group and four frame motors, the latter being used on the spinning frames. Each motor is equipped with an automatic control device comprising both overload and undervoltage features.

The electrical apparatus was furnished by the General Electric Company, the boilers by Bigelow Company, and the condenser by C. H. Wheeler Manufacturing Co. The building was constructed under the supervision of the owner. The power plant and the electrification of both mills were planned by J. E. Sirrine & Company, Engineers, of Greenville, S. C., and New York City.

lows. The village has 180 houses, each with water sewerage and electric lights. Special dormitories were designed for the girls working in the mill and every convenience possible provided. Robert & Co., Atlanta, were the engineers.

Efird Manufacturing Co., Albemarle, N. C.—This company has just completed the new No. 5 Mill, which is of the slow burning mill construction type, 382 feet long by 100 feet wide—two stories with basement. This new 12,000 spindle unit is on fine yarn, operating in connection with the other mills of this group. One of the unusual features of this mill is that the entire equipment is chain driven, with individual four-frame or line shaft. This mill is being watched with much interest as this is quite a new feature in textile work. The engineering work was done by Robert &



EAGLE & PHOENIX MILLS, COLUMBUS, GA.

Rebuilt old hydro-electric power house and built a new hydro-electric power house including machinery over old water wheels, abandoning mechanical drive and made changes in dam. From a shortage of power the mill now has power to sell as they develop on the average of 6,000 horse power. Lockwood, Greene & Co., engineers, Atlanta, Ga.

Peerless Cotton Mills, Thomaston, Georgia.—One of the larger textile developments built in the South during the past year is the new Peerless Mill at Thomaston. This mill is a 30,000 spindle unit, manufacturing tire fabric, and was built as a complete new plant, including a power sub-station, warehouse and an attractive village equipped with water and sewerage systems and electric lights. The plant consists of a main mill building, 510 feet long, and 130 feet wide, two stories, with partial basement. The power plant, which is in a separate building, is combined with a machine shop and switchboard room. This unit is 40 feet wide by 130 feet long. There are four compartments of warehouses—50 x 100 two stories high. All of the textile equipment is individually electric driven. Special study was given the artificial lighting of the mill and the latest type of fixtures were used throughout. A careful study was given the location of the mill and village and topographic surveys and layouts were furnished by E. S. Draper, Landscape Architect, of Charlotte. The village, which is one of the most attractive in the South, is beautifully located and filled with three, four and five room bungaCompany, Atlanta, Ga.

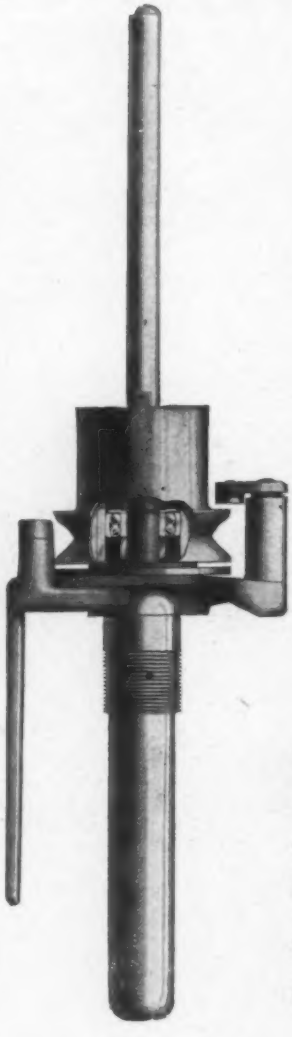
San Antonio Cotton Mills, San Antonio, Texas.—This is one of the largest mills in San Antonio, being of reinforced concrete 420 feet long and 56 feet wide. The mill was designed for an ultimate width of 112 feet and its extension is contemplated in the near future. The boiler plant, machine shops, etc., are in separate buildings centrally located. The warehouse facilities consist of two compartments, 60 x 120, built of reinforced concrete connected to the picker room with a system of concrete platforms. A complete village was built in connection with this development, and the plant is just starting operation, using a number of Mexicans as operatives. This plant is equipped with the latest type individual electric machinery and its initial production will be heavy cotton duck. Robert & Company, Atlanta Ga., were the engineers.

Dunean Silk Mill.

The Dunean Mills of Greenville, S. C., have been operating for years on the production of fine cloths. In the manufacture of some of the shirtings a silk warp is used.

Some time ago the management considered it desirable

ALLEN BALL BEARING SPINDLES



The Ball Bearing Principle

is

Fundamental

Save Power

Increase Production

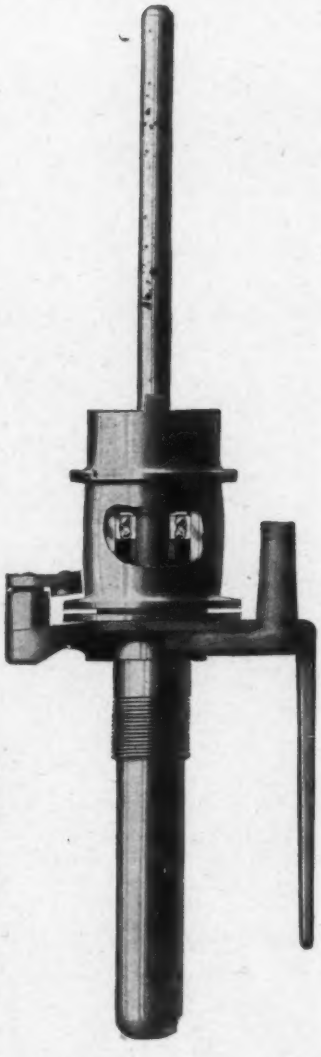
NOW IS THE TIME

TO INSTALL

BALL BEARING TWISTER SPINDLES

A NEW SOURCE OF SPINDLE SERVICE

Thoroughly Reliable Spindles are Appreciated by the Leading Mills and Machinery Manufacturers



Allen Spindle Corporation

80 BOYLSTON STREET

BOSTON, MASSACHUSETTS

New prices are now in effect

Allow us to quote !!!

ELLIOTT A. ALLEN, President.

G. G. SLAUGHTER MACHINERY CO.,
Greenville, S. C.
Southern Representatives

to install a separate plant for the handling of this silk yarn and the new building for this purpose has just been completed.

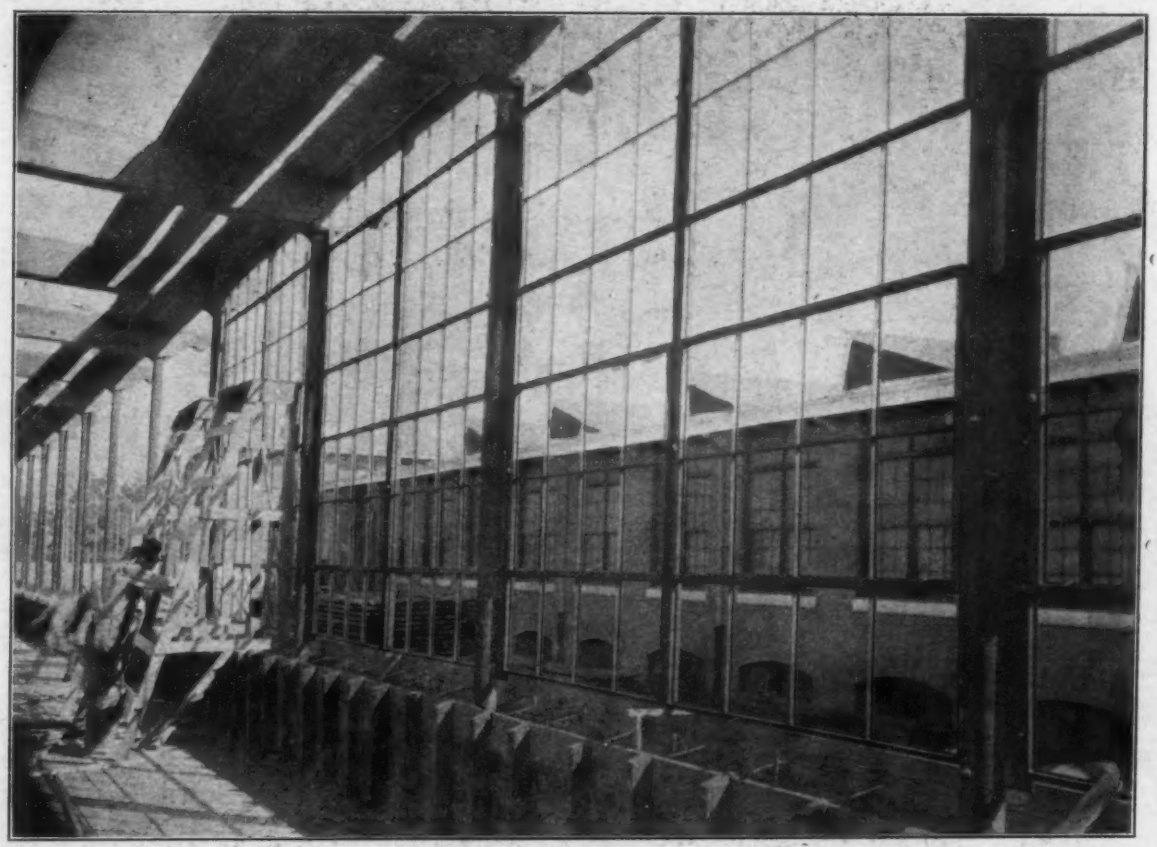
The new silk mill consists of a building 153 feet 8 inches long by 80 feet 8 inches wide, single story, daylight construction, with side walls of David Lupton Sons Company's sash, separated at 10 feet 8 inches intervals by cast iron columns extending from the foundation to the roof. A 12 inch reinforced curtain wall extends from the foundation to window sills. The floor and roof are slow burning construction; the roof is 5-ply tar and gravel on 2½ inch plank. The floor above the sills is 3 inches subfloor, 1 inch intermediate floor and 1 inch maple top. Two rows of cast iron columns are spaced 10 feet 8 inches longitudinally, and are on 27 foot 6 inch and 25 foot 8 inch centers across the building. The ceiling height is 15 feet to the bottom of roof beams. This construction is of special interest, providing as it does a maximum amount of natural light at a minimum cost for permanent materials.

The machinery equipment furnished by Benjamin Eastwood Company, Paterson, N. J., is individual motor driven. It consists of 2 boiling vats, 1 hydro-extractor, driven by 5 hp. motor; 8 spool winders, driven by ½ hp. motors; 5 horizontal warpers, driven by 1½ hp. mtors; and 3 direct warpers, driven by ½ hp. motors.

The lighting will be a direct system, using R. L. M. reflectors and 200 watt bowl enameled lamps mounted 14 feet above the floor. The building will be heated by the Webster vacuum system using direct overhead coil radiation and taking steam from the existing central boiler plant.

The humidifier system is the Parks-Cramer high duty head type, and can be operated in conjunction with the main mill system or independently.

J. E. Sirrine & Company, Greenville, S. C., and New York, are the engineers. Henry Construction Company are the building contractors, and Huntington & Guerry are the electrical contractors, both of Greenville, S. C.



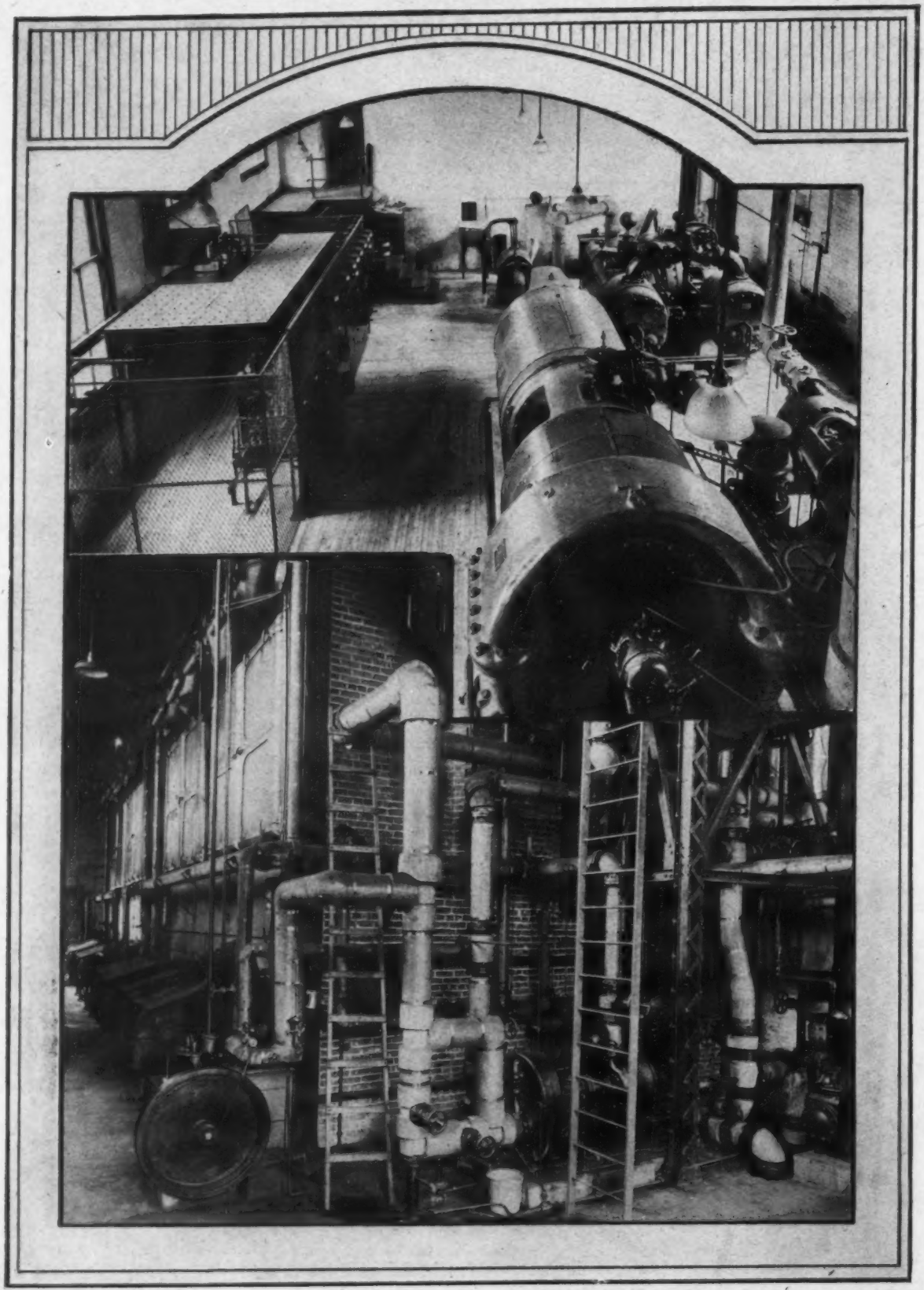
DUNEAN SILK MILL, GREENVILLE, S. C. A CONSTRUCTION PHOTOGRAPH SHOWING CONCRETE CURTAIN WALL FORMS AND STEEL SASH. BUILDING TO HOUSE MACHINERY FOR THE PREPARATION OF SILK WARP YARN.

Exposition Cotton Mills Power Plant.

A new steam-electric power plant of 3,000 kw. capacity has been completed at the Exposition Cotton Mills, Atlanta, Ga. These mills operate 60,000 spindles producing sheetings and drills, and the mill property consists of two general groups of buildings known respectively as Mill No. 1 and Mill No. 2. Originally each mill was driven mechanically by a reciprocating steam engine, but electric motors have been installed throughout the two mills and the system is now arranged so that the two mills can be operated either from purchased electric power or the locally generated steam-electric power.

The new plant was installed in the old power plant buildings of Mill No. 2, remodeled and changed to suit the new equipment. The boiler equipment consists of four 509-hp. Babcock & Wilcox water-tube boilers. These are set in two batteries and built for a safe working pressure of 200 lb. a sq. in. and 100 degrees superheat.

Coal is dumped from cars on the coal trestle into a pocket at the boiler room doors. Under each boiler there is



POWER PLANT AT THE EXPOSITION COTTON MILLS, ATLANTA, GA. TURBINE ROOM AT TOP, BOILER ROOM BELOW.. DESIGNED BY J. E. SIRRINE & CO., GREENVILLE, S. C.

a 5-retort Westinghouse underfeed stoker; the line shafting for driving these stokers is driven by a Westinghouse standard stoker engine through silent chains. A new concrete smoke breeching connects the boilers to the old brick stack and the forced draft equipment consists of a motor-driven Buffalo conoidal fan. Ashes are dumped into a car which runs in a tunnel under the boilers and are then delivered to a hoist at the end of the room. All boilers are equipped with Diamond soot blowers.

Included in the boiler feed equipment are two Worthington steam pumps and one Alberger centrifugal pump driven by an Alberger-Curtis steam turbine. The boiler feed pumps take water from a Lea V-notch meter which in turn receives it from a Swartwout open feed water heater. The exhaust steam from all steam-driven auxiliaries is used for heating this feed water. The make-up water for feeding the boilers is taken from the condenser hot well and a Deane of Holyoke tank pump is used for supplying this water to the heater.

Exhaust steam from the turbine is condensed in a Beyer barometric condenser. A dry vacuum pump driven by a compound engine is placed in the turbine room for exhausting the air and non-condensable vapors from the condenser. Circulating water is supplied by a motor-driven Cameron centrifugal pump, which is located in the pump house near the spray pond. The condenser is designed to produce a vacuum of 2-lb. absolute back pressure with 80 deg. circulating water. Water from the hot well is sprayed from a Schutte-Koerting spray system, and the temperature of the circulating water is reduced 15 deg. during this process. A Goulds centrifugal pump, motor-driven, is used for spraying this water.

Power piping was designed to take care of expansion and contraction in all directions without the straining of the pipe, valves or fittings. Where bends were necessary they were made at a 90 deg. angle, and some at 45 deg., in order that minimum size pipe could be used with the highest velocity without erosion of the piping, valve seats and fittings. All valves, fittings and piping on steam lines are made of steel and the valves have monel metal seats and stems. The plant is now producing a kilowatt-hour with approximately 25,550 B.t.u., including auxiliaries in the turbine plant.

The main power unit is a 3,750 kv-a., 3,000-kw., 3,600-r.p.m., 600-volt, 3-phase 60-cycle, General Electric generator, with direct-connected exciter, directly connected to a Curtis steam turbine. An auxiliary exciter set consists of a 35-kw., 3,600-r.p.m., 125-volt, G. E. generator directly connected to a Curtis steam turbine. This set is designed also for the operation of boiler room lights and valve motors before the main unit is started up. The power for night lighting and a few motors operating speed machinery, when the main unit is closed down, is supplied by a 200-kw., 600-volt, 3-phase, 60-cycle, G. E. generator directly connected to a Curtis steam turbine which runs non-condensing.

Each mill has a separate feeder panel switchboard for power and lighting distribution, consequently, after providing for generators and exciters very few panels were required in the new plant switchboard. A feeder panel was provided for each mill and for power plant motor-driven auxiliaries. Double-throw switches allow the auxiliaries to be operated by either generator. Each generator panel and each mill feeder panel has a watthour meter. Oil switches are equipped with inverse time limit relays and undervoltage releases.

Provision is made at each mill feeder switchboard for operation on either purchased power or locally-generated power by the installation of a 2,000-amp., triple-pole, double-throw, quick-break, lever switch, mounted on a slate slab and having four barriers. The middle terminal of this switch connects to the buses and the two sources of power to upper and lower terminals respectively. The power line connecting these switches with the power house switchboard consists of four 500,000-c.m. cables, a phase for each mill. The plant was designed by J. E. Sirrine & Company, engineers, Greenville, S. C., and the electrical installation was made by the G. M. Clayton Co., Atlanta, Ga.

Additional work in the South reported by Lockwood, Greene & Co., engineers, Boston, Charlotte and Atlanta.

Hamilton Carhartt Cotton Mills at Rock Hill, S. C. Carhartt, S. C., and Elberton, Ga.—Made appraisal and report.

Anderson Mills, Inc., Lincolnton, N. C.—Made new machinery layout to improve output.

Martinsville Cotton Mill Co.,Martinsville, Va.—Made village layout and designed new steam power plant.

Athens Manufacturing Co,, Athens, Ga.—Reported on change in product. Made machinery purchases and rearranged mill for new type of material.

General Asbestos & Rubber Co., Charleston, S. C.—Built 34 new houses for employees. Put in streets and sidewalks. Built 450 horse-power addition to power house. Made valuation of entire property. Built dispensary, manager's house and conveying system.

Pacific Mills, Columbia, S. C.—Made machinery tests. Made changes in mill and installed new humidifying outfit.

Manchester Mfg. Co., Macon, Ga.—Put in new toilet towers and elevator, purchased textile machinery and made new arrangement of machinery.

Stonewall Cotton Mills, Stonewall, Miss.—Built addition to dye house and power house, rearranged machinery, made topographic survey, designed new store and village lighting.

Pynetree Paper Company, Gordon, Ga.—Made additions and changes in machinery. Engine room, store room, tracks, pulp mill, water supply and sewers and kept mill in operation. Also added to housing facilities.

Massachusetts Cotton Mills, Lindale, Ga.—Built new laundry, boarding house, infants' school, main school addition. Auditorium and 25 houses.

Dallas Manufacturing Company, Huntsville, Ala.—Put in village water tank and pump. Electrified No. 1 mill and built new toilets.

Merrimack Manufacturing Co., Huntsville, Ala.—Built new toilet towers to No. 1 mill; also a 35,500 sq. ft. addition to No. 1 mill and a new store and auditorium of 24,000 sq. ft.

International Cotton Mills, LaGrange, Ga.—Built agents' house, overseers' houses and infants school and community building; elevator tower and office extension; made property map and put in village lighting system.

Opelika Cotton Mills, Opelika, Ala.—Built 52,800 sq. ft. addition to mill. Rebuilt stair and toilet towers, put in sewage, water and lighting for village. Built day nursery, rewired present mill.

Fulton Cotton Mill Company, Athens, Ala.—Built additions to mill, power house, office and opening room.

Henderson Cotton Mills, Henderson, Ky.—Built and

installed 1640 h. p. steam power house, electrified machinery, made alterations and additions.

Rushton Cotton Mills, Griffin, Ga.—Two-story extension 80 ft. by 125 ft. Building of brick walls, steel sash, cast iron columns, steel beams, wood floors.

Waco Twine Mill, Waco, Texas.—One story building, 104 ft. by 125 ft., built for the manufacture of cotton twine, bays 21 ft. by 25 ft.; brick walls, steel sash, wood roof, sprinkler, lighting, heating and plumbing included.

Griffin Manufacturing Company, Griffin, Ga.—Built extension to No. 1 mill and new slasher building. Slasher building being reinforced concrete skeleton, beam and slab type, 2 stories. The mill extension was two stories of brick and timber construction, plumbing, lighting, heating, and sprinklers included.

Indian Head Mills, Cordova, Ala.—Made utilities map. Built village of 52 houses, boarding house and school; electrified machinery in mill, put in humidifying and conveying systems.

Addison Mills, Edgefield, S. C.—Built new house for manager and six overseers' houses. Built 60,000 sq. ft. addition in mill, put in service and fire water systems, made machinery rearrangement.

Wateree Mills, Camden, S. C.—Built new store building, put in new looms, telephone system and humidifiers.

International Cotton Mills, Hogansville, Ga.—Built community house.

Cherry Cotton Mills, Florence, Ala.—Design and erection of new toilet towers.

Mayfield Woolen Mills, Mayfield, Ky.—Design and construction of new power plant.

Pelzer Manufacturing Company, Pelzer, S. C.—Using an old dam and head race, put in new power plant, two 1000 horse power wheels. These new wheels develop about twice the power of the three old wheels which used the same amount of water. The old wheels are still in place for use in emergencies.

Anchor Duck Mills, Rome, Ga.—Built additions to No. 1 and No. 2 mills and new power house about 93,000 square feet of floor including complete power house equipment, sprinklers, humidifying, heating, lighting and plumbing.

Buildings of brick and timber construction. Two story buildings.

Additional work in the South reported by J. E. Sirrine & Co., engineers, New York and Greenville, S. C.

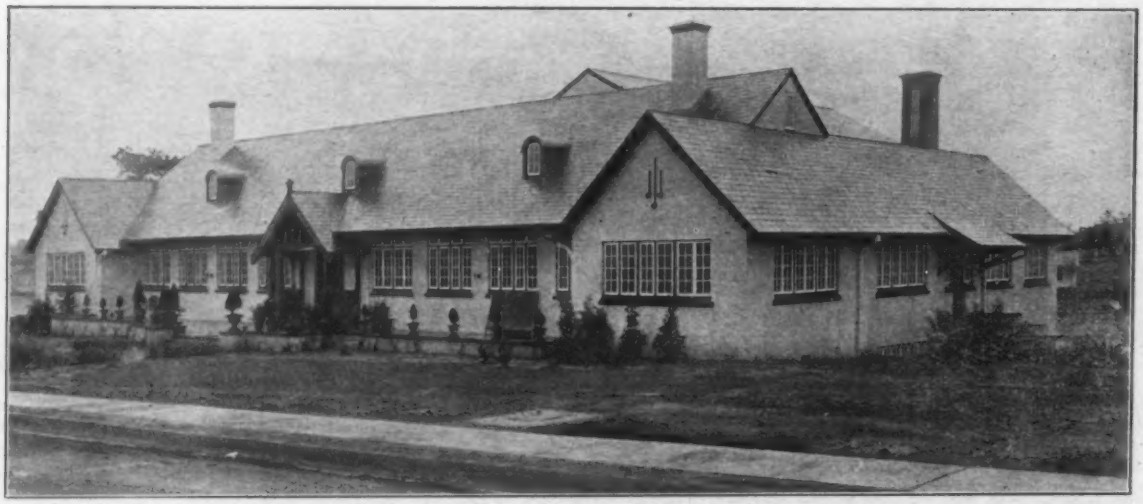
Durham Hosiery Mills, Mebane, N. C.—Mill No. 15, yarn mill; two stories; reinforced concrete. Total floor space, 62,000 square feet; 10,800 spindles.

Piedmont Manufacturing Company, Piedmont, S. C.—Mill No. 3, power plant; three vertical shaft, hydro-electric units, 375 kva. each, with switchboard and auxiliary equipment; electric drive. New laundry, ice plant and school building. Total floor space 21,000 square feet.

Darlington Manufacturing Company, Darlington, S. C.—Individual electric motor drive for 36 spinning frames. 200 kva, generator installation.

Arcadia Mills, Spartanburg, S. C.—Additions to village; village lighting of houses and streets; village water and sewer system. Partial motor drive installation.

Arcade Cotton Mills, Rock Hill, S. C.—Extension to mill. Total added floor space 11,000 square feet. Extension to village. Installation of 375 kva. generator. Partial electrification of mill. 6,048 new spindles.



COMMUNITY BUILDING, INTERNATIONAL COTTON MILLS, HOGANSVILLE, GA. DESIGNED BY LOCKWOOD, GREENE & CO., ATLANTA.

Franklin Mills, Greer, S. C.—Village lighting.

Orr Cotton Mills, Anderson, S. C.—276 individual spinning frame motors.

Chesnee Mills, Chesnee, S. C.—Installation of 1500 kva, generator. Complete electrification of mill, including 96 individual spinning frame motors.

Aragon Cotton Mills, Rock Hill, S. C.—Extensions to village. Revision of mill lighting.

Enoree Mills, Enoree, S. C.—Complete electrification, including installation of one 1500 kva, and one 1875 kva, generator, with individual motor drives for all spinning frames, and group motor drives for other departments.

Monarch Mills, Union, S. C.—Complete electrification, including individual drives for all spinning frames and group drives for other departments.

Union-Buffalo Mills Company, Union, S. C.—Electric lighting plans for the Union Mills.

Rosemary Manufacturing Company, Roanoke Rapids, N. C.—Addition of one 2500 kw. steam turbo-generator unit, with auxiliaries, to power plant.

Roanoke Mills Company, Roanoke Rapids, N. C.—Additions to mill and dye plant. Total floor space 80,000 square feet. 700 looms.

Lanett Cotton Mills, Lanett, Ala.—Extensions of weave shed. Single story, 77,000 square feet. Complete electrification of mill, including individual drive for 135 spinning frames, and group drive for other departments. Installation of an 1875 kva generator.

Baldwin Cotton Mills, Chester, S. C.—Village water and sewer system; street paving.

Bamberg Branch, Santee Mills, Bamberg, S. C.—New weave shed and extension to picker building. Total floor space 34,000 square feet. 4096 new spindles.

Blue Buckle Cotton Mills, Rock Hill, S. C.—New weave shed, dye plant, warehouses, waste house, opener room, extension to picker building 100 cottages, street improvements. Total floor space 149000 square feet. 700 new looms.

Brandon Mills, Greenville, S. C.—New duck mill, warehouses, extension to opener room. Total floor space 109,000 square feet. 4896 new spindles. New steam turbo-generator unit, 1000 kva.

Clinton Cotton Mills, Clinton, S. C.—New warehouse and opener room. Total floor space 21,100 square feet.

Caraleigh Mills Company, Raleigh, N. C.—Extension. Total floor space 19,000 square feet.

Erlanger Cotton Mills, Lexington, N. C.—Nursery building, new cottages, opener room. Total floor space 16,000 square feet.

Erwin Cotton Mills, Durham, N. C.—Picker room extension.

Fairmont Manufacturing Company, Fairmont, S. C.—New cloth storage building. Total floor space 6,000 square feet.

Florence Cotton Mills, Forest City, N. C.—Cloth room. Total floor space 14,000 square feet.

Fountain Inn Manufacturing Company, Fountain Inn, S. C.—Street paving; water and sewer system.

Franklinton Hosiery Mills, Franklinton, N. C.—New knitting mill. Total floor space 14,400 square feet.

Fountain Cotton Mills, Tarboro, N. C.—Extension. Total floor space 40,000 square feet. 4224 new spindles; 250 new looms.

Georgia Cotton Mills, Griffin, Ga.—New bleachery building. Total floor space 20,000 square feet.

Gluck Mills, Anderson, S. C.—Water system.

C. M. Goodyear Company, Greenville, S. C.—New warehouses. Total floor space 50,000 square feet.

Halifax Cotton Mills, South Boston, Va.—New weave shed. Total floor space 31,000 square feet. Reinforced concrete and brick construction, and timber framing; work started July 1st and was completed October 15th; built by The Foundation Co. 213 new looms.

Inverness Cotton Mills, Winston-Salem, N. C.—New warehouse. Total floor space 5000 square feet.

Keowee Yarn Mills, Walhalla, S. C.—Steam plant and textile machinery change. 4928 new spindles.

JENCKES SPINNING CO., LORAY MILLS DIVISION, GASTONIA, N. C.

Men's Dormitory on the left. Women's Domitory at extremeright. The single story connecting building is the Cafeteria. Building designed by Robert & Company, engineers, Atlanta, Ga. Cafe-teria equipment furnished by Albert Pick & Co. The mill may be seen in the back ground.

Lawrence Cotton Mills, Durham, N. C.—Extension. Total floor space 17,500 square feet. 5120 new spindles.

Musgrove Mills, Gaffney, S. C.—New mill, warehouses. etc. Total floor space 120,000 square feet. 15,120 new spindles.

Mooresville Cotton Mills, Mooresville, N. C.—New dye plant and boiler house. Total floor space 33,000 square feet.

Norris Cotton Mills, Cateechee, S. C.—New warehouse. Total floor space 15,400 square feet.

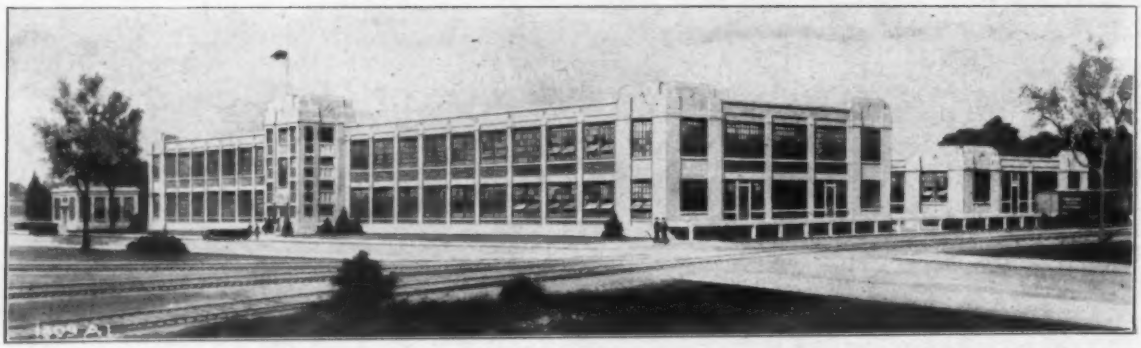
Samoset Cotton Mills, Talladega, Ala.—New weave shed and dye plant. Total floor space 125,000 square feet. 720 new spindles.

Simpsonville Cotton Mills, Simpsonville, S. C.—Street paving, water and sewer system.

Stonecutter Mills Company, Spindale, N. C.—New weave shed and warehouse. Total floor space 91,700 square feet. 500 looms.

Union Bleaching & Finishing Company, Greenville, S. C.—New extension. Total floor space 45,000 square feet.

Ware Shoals Manufacturing Company, Ware Shoals,



DIXIE MERCERIZING COMPANY, CHATTANOOGA, TENN.

Complete new plant for mercerizing cotton. Two buildings of concrete skeleton type, beam and girder and slab, and architectural treatment in concrete; 100,500 square feet of floor area; sprinklers, heating, plumbing, lighting, humidifying, power house complete. One building 1 story; one building two stories. Lockwood, Greene & Co., Atlanta, Ga., engineers.

S. C.—Ice plant, boarding house, residence, dairy, barn extension. Total floor space 16,000 square feet.

Woodside Cotton Mills, Greenville S. C.—Waste house, water and sewer system, street paving. Total floor space 13,200 square feet.

Yadkin Finishing Company, Yadkin, N. C.—New storage building. Total floor space 5,252 square feet.

West Point Manufacturing Company, Fairfax Ala.—Extension to dye plant. Total floor space 18,340 square feet.

Coosa Manufacturing Company, Piedmont, Ala.—New mill, reinforced concrete building. Total floor space 78,000 square feet. 18,220 new spindles.

Equinox Mills Anderson, S. C.—Individual electric motor drive for spinning frames and twisters. Group motor drive for other departments. Village water system.

Maysville Power Company, Maysville, Ky.—Additional 1000 kw. steam turbo-generator unit in power plant.

Maysville Cotton Mills, Maysville, Ky.—New electric lighting system for mill.

Mt. Vernon-Woodberry Mills Company, Tallassee, Ala.—New hydro-electric unit, with switchboard and auxiliary equipment in power plant.

Cohannet Mills, Fingerville, S. C.—Electric motor drive with generator on water wheel.

Enterprise Manufacturing Company, Augusta, Ga.—New hydro-electric power plant. Electric motor drive throughout. New lighting system for mill.

Augusta Factory, Augusta, Ga.—Machinery reorganization. Electric motor drive.

Textile Industrial Institute, Spartanburg, S. C.—New mill complete. Two-story reinforced concrete building, daylight construction. Total floor space 14,500 square feet. 2016 spindles, 42 looms.

Roxboro Cotton Mills, Longhurst, N. C.—New mill complete. Total floor space 78,136 square feet. Reorganization of textile machinery. Electric motor drive. 10,080 new spindles.

Avondale Mills, Alexander City Plant, Alexander City, Ala.—Two-story extension. Total floor space 66,712 square feet. Individual electric drive on looms and spinning frames. Group drives in other departments. 15,360 new spindles.

Cash Mills, Gaffney, S. C.—New mill. Two-story building standard mill construction. Total floor space 89,880 square feet. 10,240 new spindles.

Eastside Manufacturing Company, Gaffney, S. C.—New mill. Two-story building, standard mill construction. Total floor space 96,295 square feet. 10,240 new spindles.

Spartanburg County Mills, Spartanburg, S. C.—New mill. Total floor space 50,580 square feet. 11,392 new spindles.

Anniston Manufacturing Company, Anniston, Ala.—Electric motor drive. Individual motor drive on spinning. Group drive in other departments.

Osage Manufacturing Company, Bessemer City, N. C.—Electric group motor drive.

Southern Mercerizing Company Tryon, N. C.—New mill. Total floor space 6,060 square feet.

Sibley Manufacturing Company, Augusta, Ga.—Electric motor drive. New hydro-electric unit in power plant.

Langley Manufacturing Company, Langley, S. C.—New steam turbo-generator. 1000 kw. unit, and textile machinery change.

Vardry Mills, Greenville S. C.—Individual motor drives for spinning frames and twisters.

Camperdown Mills, Greenville, S. C.—Electric motor drive throughout. Individual motors on spinning frames. Generator installation.

Consolidated Textile Corporation, Lynchburg Div., Lynchburg, Va.—Electric motor drive and additional looms.

Consolidated Textile Corporation, Pilot Div., Raleigh, N. C.—Extension to dye plant.

Consolidated Textile Corporation, Ossipee Div., Burlington, N. C.—Reorganization of machinery.

Consolidated Textile Corporation, Henderson Div., Henderson, Ky.—Additional looms.

Graniteville Manufacturing Company, Graniteville, S. C., Vaucluse Plant—Individual electric motor drive on spinning. Group drive in other departments. Installation of generator on water wheels.

Santee Mills, Orangeburg Plant, Orangeburg, S. C.—New warehouse and machinery changes.

Pomona Mills, Inc., Greensboro, N. C.—Extension. Total floor space 31,680 square feet.

Anderson Cotton Mills, Anderson, S. C.—Revision of motor drives.

Easley Cotton Mills, Easley, S. C.—Laundry building, warehouse, village fire protection system, toilet tower. Total floor space 19,000 square feet.

Standard Bonded Warehouse Co., Charlotte, N. C.—Warehouses and office building. Total floor space 166,000 square feet.

(*Continued on page* 247.)

Printing the Sulphide Colors

BY WILLIAM B. NANSON.

This class of colors form leuco-compounds like indigo, and can be applied to cotton goods in practically the same manner, except that the proportionate quantities of alkali and reducing agent must be differently arranged. Either glucose or the stable hydrosulphites may be used for the reducing agent, but I would advise the latter as giving the most satisfactory results and being the most convenient to use.

Owing, however, to the presence of polysulphides with the consequent formation of copper sulphide, the copper printing rollers are apt to become blackened by the action of the color and to some this has become a great drawback to the use of the sulphide colors in printing. This blackening process can be largely overcome by adding sodium sulphite or bisulphite to the printing pastes, but if this is done hydrosulphites, as reducing agents, could not be used because the final result of the reactions between the sulphite or bisulphite, the hydrosulphite, and the polysulphides or free sulphur in the coloring matter would be that the polysulphides would remain practically unaffected.

Improvements have been made latterly by which many of the sulphide dyestuffs have been largely freed from sulphur and polysulphides and therefore they do not affect the printing rollers injuriously. The immedial colors "soluble" and the D brands of the thiogene series are typical examples of these improved products. Some of these colors yield the best results with pure hydrosulphite of soda in powder, but, on the other hand, others yield the best results with sulphoxylate formaldehyde compounds such as hyraldite, rongalite or hydrosulphite NF. These latter compounds yield the most stable colors no doubt but the stability of colors prepared with hydrosulphite in powder ($Na_2S_2O_4$) is good enough for all practical purposes.

If there is any call for these colors in large quantities it will not do to make them ahead, as they are partially decomposed by long standing, and therefore they should be made only in small lots as required if the color is to be kept in good condition.

The printing of sulphide colors requires care and is difficult. Plenty of moisture is necessary to their successful fixation and any over-drying of the fabric is fatal to good results. This over-drying is somewhat guarded against by adding glycerin to the color paste for the printing machines but even this does not always prove infallible. If the goods could be dried in moderately hot air instead of over the drying cans it would be better. China clay is sometimes added to some of the color pastes to prevent them from running while being steamed in wet steam.

The printing pastes for the sulphide colors are usually prepared as follows: The dyestuff is mixed, with constant stirring, with water, caustic soda, glycerin, china clay and either glucose or one of the hydrosulphites mentioned. This mixture is then heated until the coloring matter is thoroughly dissolved and reduced to its leuco-compound, and it is then added to the thickening which is alkaline; this mass is well mixed together and warmed again until a perfectly smooth paste is formed, which, after cooling down, is ready for printing.

For very light shades the quantity of alkali may be reduced to a point that will just suffice for the solution of the dyestuff but it is usually the safest plan to make the color pastes strongly alkaline.

Following are given some recipes as typical methods of compounding sulphide printing colors:

Black: 80 grams thiogene black M. D. conc.; 50 grams glycerin; 150 grams caustic soda 25 degrees Tw.; 80 grams china clay paste 50 per cent; 40 grams hydrosulphite NF conc. Mix and add to 600 grams alkaline thickening. This alkaline thickening is made from 1,500 grams British gum and 8,500 grams caustic soda 77 degrees Tw. Mix in the cold and then heat to 140 degrees F. The British gum specified is the gum thickening and is made from 350 grams British gum (dextrine) and 650 grams water.

Light blue: 10 grams thiogene cyanine CD extra; 30 grams glycerin; 30 grams caustic soda 25 degrees Tw.; 150 grams water; 150 grams china clay paste 50 per cent; 20 grams hydrosulphite NF conc.; 610 alkaline thickening.

Use thiogene green C. L. D. extra conc. for green. Use thiogene yellow for yellow color. Use thiogene grey B. D. extra conc. for grey color. All other constituents as for light blue.

Dark blue: 25 grams thiogene cyanine OD extra; 50 grams glycerin; 150 grams caustic soda 25 degrees Tw.; 100 grams china clay paste 50 per cent; 20 grams hydrosulphite NF conc. Mix and add to 600 grams alkaline thickening; 55 grams gum senegal mucilage. The china clay paste is made from 1,000 grams china clay and 1,000 grams water ground together free from lumps. The gum senegal mucilage is made from 5,000 grams gum senegal and 5,000 grams water. Allow to soak in cold water overnight and then boil up.

Dark navy blue: 50 grams kyrogene pure blue R; 75 grams glycerin; 100 grams boiling water; mix and add to 173 grams alkaline thickening, 480 grams British gum starch paste, 60 grams glucose. Heat 20 minutes at 150 degrees F., cool, allow to stand twelve hours and then add 60 grams glucose.

The immedial and other sulphide colors can be worked in the same way, for instance:

Printing color A: 40 grams immedial indone B; 30 grams glycerin; 30 grams caustic soda 70 degrees Tw.; 100 grams boiling water. Mix and add to 630 grams alkaline thickening (2:1); 100 grams china clay paste 50 per cent. Heat at 140 degrees F. until the dyestuff is dissolved, then cool and add 35 grams hyraldite C extra and 35 grams water.

Printing color B: 40 grams any indanthrene color, soluble; 40 grams caustic soda 70 degrees Tw.; 25 grams glycerin; 100 grams boiling water. Mix and add to 645 grams alkaline thickening (2:1); 100 grams china clay paste 50 per cent. Heat to 140 degrees F. then add 25 grams glucose. Stir for a while, cool and then add further 25 grams glucose.

All the other series of sulphide colors can be applied as per one or the other of these types.

After printing sulphide colors they are dried and then

passed once or twice through wet hot steam at 216 degrees F. The goods are usually steamed in the rapid ager and lasts from 3 to 5 minutes. The goods should then be run through one or the other of the following solutions; (1) 1,000 grams water; 10 grams sulphuric acid 168 degrees Tw.; 5 grams bichromate of potash. (2) 1,000 grams water; 10 grams sulphuric acid. (3) 1,000 grams water; 10 grams sulphuric acid and 2 grams sulphate of copper. They are then well washed and soaped.

It has been the experience of the writer that both sulphate of copper and bichrome while they may help in the fastening and developing of the colors, tend to deaden their brightness. The sulphide colors are an excellent thing for the direct printing of shirtings and dress goods that have to withstand severe laundering and sunlight. There have been objections made to them in the past on account of their impurity and insoluble qualities and the difficulty of working them in printing pastes. In later years, however, there is no valid reason why the sulphide colors should not be generally used. They are now made of great purity and solubility and fast and fairly bright colors are procurable. The colors which are purified specially for printing will not blacken the copper printing rollers to any appreciable extent and only a short steaming is necessary for their fixation while they yield moderately bright colors of sufficient fastness to washing and light. Besides all this they yield themselves readily to "resists" which makes them especially valuable for the production of direct printed effects of the "print and cover" style of work that could only be obtained in former times by the longer method of dyeing on a previously printed, aged and fixed mordant.

It is possible to use a much stronger mixture of hydrosulphite on sulphide colors than is necessary for their reduction and this makes them valuable as "discharge colors" on paranitraniline red and other insoluble azo colors, and also on direct dyestuffs. They are not very bright colors but for quiet effects and where fastness is a desideratum they are exceptionally useful. If we wish brightness, fullness and fastness combined, nothing as yet has gotten ahead of the vat dyestuffs; but the sulphide colors are none the less useful for a large variety of styles and they include a greater range of shades than do the vat colors proper.

Like the ciba colors, indanthrenes and indigo, it is possible to print them on naphthol prepared cloth in conjunction with any insoluble azo color. They are, moreover, dischargeable by the chlorate prussiate method; and as they are easily reserved by zinc salts, they can be used for a very great variety of styles.

Most of the sulphide colors are sensitive to chlorine but in all other respects they represent one of the fastest classes of colors known. It must not be understood, however, that all sulphide colors must necessarily be fast, because there are some that have no claim to be called even moderately fast.

The Discharge Style on Sulphur Colors.

Many attempts have been made to produce colored and white discharge effects upon grounds dyed with the sulphide colors but without meeting with any very brilliant success. The best that has been done is based upon the employment of powerful oxidizing agents and the chlorate discharges may be considered as the best. Few of the sulphide colors yield good whites even with chlorate discharges and only then when the discharge paste is abnormally strong. In some styles of goods a dull white is sometimes more useful than a pure white but for most styles the impossibility of getting a good white discharge is fatal to the use of the sulphide color. While the sulphide colors are easily destroyed by the chlorate pastes they form greyish or brownish oxidization products which, in the majority of cases, cannot be entirely removed from the fiber. This drawback may not matter in some cases but it has resulted in the chlorate discharge process being discarded in favor of the zinc chloride resist process, which allows the production of a large variety of styles and without the danger of poor whites and the tendering of the fiber which is a common risk with all oxidization discharges. For white discharges on medium or light shades and for all colored discharges the chlorate paste following may be used: 250 grams British gum powder; 470 grams water; 200 grams chlorate of soda; boil and cool to 86 degrees F. and then add 50 grams yellow prussiate of potash (finely ground); 30 grams citrate of ammonia 50 degrees Tw.

For dark shades and blacks the following aluminum chlorate discharge gives good results, especially in fine patterns. Large patterns are not suitable for sulphide discharges as they expose the impurity of the white too much. White discharge A. B.: 150 grams British gum; 600 grams chlorate of alumina 42 degrees Tw.; 50 grams clay. Beat the clay to a cream with the chlorate, and then heat the whole to 167 to 176 degrees F. and add 150 grams of chlorate of soda. Dissolve, cool and add 50 grams red prussiate of potash (powdered).

For pigment color discharges the white discharge given may be used as follows: Yellow discharge A. B.: 300 grams chrome yellow paste; 150 grams albumen solution 40 to 50 per cent; 525 grams white discharge A. B.; 25 grams citrate of ammonia 50 degrees Tw.

Vermillion, the ochres, Guignet green, lakes, etc., may be used in place of the chrome yellow or mixed for compound shades. The cloth is first dyed with the sulphide color and dried; it is then printed with the chlorate-prussiate color or white discharge and dried and steamed for five minutes in the rapid ager at 212 degrees F., washed well, and soaped at 176 to 194 degrees F. for 5 minutes; then washed again and dried.

Resists Under the Sulphide Colors.

Certain metallic salts possess the property of preventing the fixation of the sulphide colors on the fiber, and on this fact is based the resist process patented by the firm of Leopold Casella & Co. This process depends upon the employment of zinc salts, which not only give exceedingly good resists but also have no injurious action on the cloth. Other salts, as for instance, manganese, cadmium, iron, tin and aluminum, are similarly effective for certain styles of work, but none of them is quite so effective as the zinc salts, nor are any of them applicable to so many varieties of colored reserves.

The zinc salt which is most suitable for this purpose and which yields by far the best results is the chloride.

The resisting action of zinc and other metallic salts is due to their property of precipitating the sulphide colors from their solutions in alkali and sodium sulphide. What chemical reaction really takes place has never been definitely decided but it may be probable that they form insoluble metallic leuco-compounds of the color.

Salts possessing strongly marked acid properties invariably give the best results, therefore the acid character of a salt doubtless determines to a great extent its suitability as a resisting agent, at the same time the base is also an important factor and the salt in which the combined resisting action of base and acid is most pronounced is zinc chloride which, owing to its great solubility, is peculiarly well adapted to the production of resist effects with comparatively fine patterns, under dark shades of sulphide colors.

The introduction of pure and readily soluble sulphide colors has resulted not merely in removing all the practical difficulties of dyeing, but has rendered easily possible the production of a great variety of fast level and to some extent bright shades. In conjunction with zinc chloride resists, these facilities afford a ready means of obtaining many novel effects in white and fast colors on dark shades of sulphide color grounds. It is best to dye resist styles in a continuous manner by giving the printed goods a single run through a padding machine like the one shown in Figure 1, fitted with a comparatively small color box.

By this means dark shades of blue, brown, green and

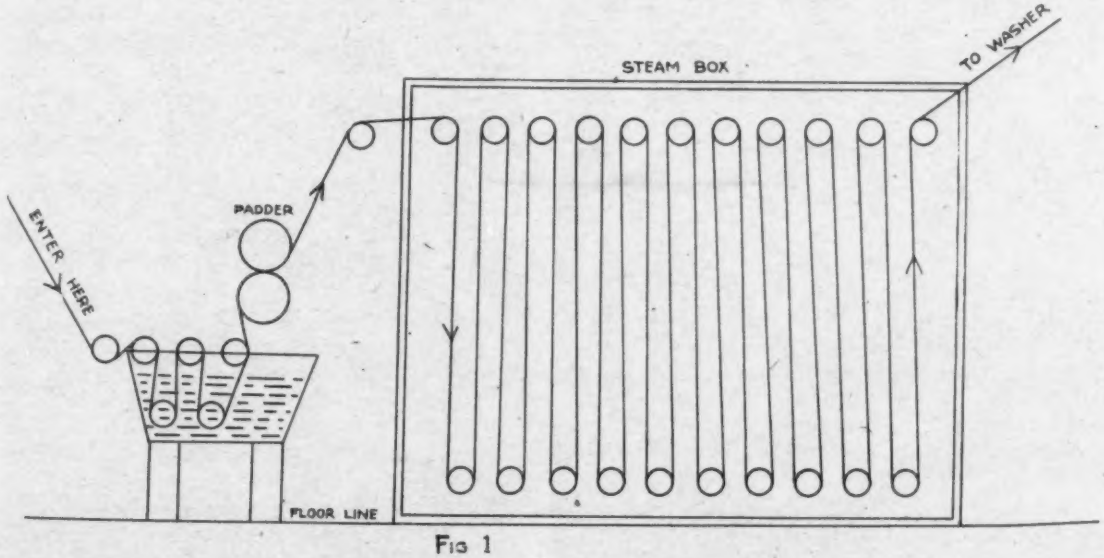


FIG 1

even black may be dyed of excellent fastness, and the short immersion of the fabric in the dye liquor has the advantage over longer methods of allowing no time for the reserving agents to dissolve off in the dye bath.

In order to obtain the best results both as regarding the sharpness of the impression and purity of the resist effects and to assist the thorough and uniform absorption of the dye liquor by the cloth it has been found the best to dissolve the dyestuff in glucose and caustic soda rather than in sodium sulphide or hydrosulphite and caustic soda.

The glucose-alkali process of dyeing sulphide colors is easy of application and requires no more than ordinary care. Excellent resist whites (by the zinc chloride method) under full and level shades are readily obtained and no precipitation of the dye in the dyebath is to be feared as an excess of either alkali or glucose has no detrimental effect on the resist pastes.

Padding liquors containing sodium sulphide are unsatisfactory, any excess of sodium sulphide will dull the whites and colored resists and a deficiency of sodium sulphide causes uneven dyeng owing to the fact that zinc chloride resists dissolve in the dye liquor, and by combining with the solvent to form zinc sulphide, precipitates the coloring matter in the dyebath. Hence I would not advise the use of sodium sulphide except where either the glucose or hydrosulphite process will not work.

An important operation in the dyeing of sulphide colors is the steaming of the goods after dyeing. Contrary to the usual custom the sulphide colors must be steamed in a *wet* state. The real dyeing of the material is not effected during the process of padding, but by the subsequent oxidation on the fiber of the reduced dyestuff it has absorbed. At first, the goods, after padding, were subjected to a more or less prolonged exposure to the air, to bring about the necessary reoxidation but this method now gives way to a short steaming in a mixture of low pressure steam and air. Under the action of the wet steam the dye liquor penetrates the fiber better and the color is more evenly developed and darker and faster ground shades are obtained without affecting the action of the resist or of tendering the fabric. With equal quantities of dyestuffs the shade produced by steaming is often twice the depth of that produced by oxidation by exposure to the air so that, outside of its other more obvious advantages, it is the most economical process to use, as it allows of the dyestuff being utilized to the fullest extent.

The usual method of applying the zinc chloride resist is as follows: The goods, after being printed with the resist color in the usual manner, are padded on a two-bowl padding machine (Fig. 1) through a solution of the sulphide color. The padding box is made to hold 16 to 22 gallons so that the printed resists will not be injured by a too long immersion. After squeezing the padded cloth is passed directly, without any intermediate drying, through a steam box situated immediately behind the padder (as shown in Fig. 1). Any kind of a closed chamber fitted with top and bottom guide rollers will answer, so long as it is large enough to allow of the goods being steamed from four to six minutes. The presence of air in the steam box is necessary and must be provided for if the

best use of the dyestuff is to be made. Usually an ordinary ager will fill the bill but equally good results are obtained from a simple wooden steaming box as shown. After steaming, the printed and padded cloth is rinsed in water, soured in dilute hydrochloric acid, washed, soaped, washed again and dried. The process is very simple and reliable, the two points to observe are that the cloth must pass through in the open without "creases" and that the goods be sufficiently steamed to develop the color fully. Creases and a too short steaming make for streaky and unlevel color.

The following recipes for resist colors and dye baths will illustrate the far reaching importance of the sulphide color process:

Resist white B: 200 grams British gum, 250 grams water; heat until dissolved. 400 grams zinc chloride, 150 grams water; heat until dissolved. Mix the two solutions together. If the resist white is found to run when printed with heavy patterns it may have 75 to 100 grams of china clay added to it per kilo of color.

For fast red, pink, claret and orange resists the azo colors developed on the fiber will work well.

Resist red: 450 grams 6 per cent tragacanth thickening; 200 grams zinc chloride; 165 grams china clay paste 50 per cent; 15 oxalic acid. Dissolve and cool to 32 degrees F. and add 150 grams diazo solution X; 20 grams acetate of soda.

Diazo Solution X: 100 grams paranitraniline, 55 grams nitrite of soda, 350 grams ice and water. Stir well together and add 240 grams hydrochloric acid 30 degrees Tw.; 170 grams ice.

For claret, pink and orange the diazo solutions of a-naphthylamine, azo rose, and meta-nitraniline are used in place of paranitraniline and all azo colors must of course be printed on cloth prepared with beta-naphthol.

The blues, violets, greens and olives are best obtained from mordant colors. The basic aniline colors can also be used as resists but are not so reliable nor fast as the azo or mordant colors. The following is an example of a mordant color resist under a sulphide ground:

Green: 20 grams chrome blue; 40 grams anthracene yellow; 300 grams water; 150 grams china clay paste; 10 grams formic acid; 200 grams British gum powder. Dissolve and add 100 grams acetate of chrome 32 degrees Tw.; 180 grams zinc chloride solution 75 per cent.

Whenever the mordant or basic colors are used, either alone or in combination with the azo colors, the printed goods are steamed in the rapid ager before dyeing, so as to fix their color lakes on the fiber.

As has already been stated, the dyeing of the printed pieces may be accomplished by (1) sodium sulphide and the ordinary sulphide dyes, or (2) by the use of the pure soluble sulphide colors and caustic soda and glucose.

(A) Sodium sulphide method. Pad once through a solution of the dye in sulphide of soda and soda ash with or without the addition of Turkey red oil. The concentration of the bath varies with the depth of shade required. The following proportions may be considered as being about right:

	Light		Dark	
Grams	10	to	60	color
Grams	15	to	90	sodium sulphide
Grams	20	to	25	soda ash
Grams	4	to	5	Turkey red oil 25 per cent.
Grams	1000	to	1000	water.

Light shades are usually run cold but dark shades should be run at 122 to 140 degrees F. After dyeing the goods should be steamed, rinsed, soured, washed and soaped.

(B) Glucose alkali method. The soluble immedial colors are especially suited for dyeing with caustic soda and glucose and although many of the pure sulphide colors under other brands are equally as good the process given is from the immedial standpoint as a type. The dye bath is made up as follows:

	Light		Dark	
Grams	10	to	60	color
Grams	10	to	60	caustic soda 77 degrees Tw.
Grams	20	to	40	soda ash
Grams	10	to	60	glucose
Grams	4	to	5	Turkey red oil
Grams	1000	to	1000	water.

Pad, squeeze, steam four to six minutes, rinse in cold water, sour in dilute hydrochloric acid ¼ to ½ Tw., wash, soap well, wash thoroughly and dry.

Cover patterns may be printed with the various zinc chloride resists. The cloth being first printed with the resist and then covered with a sulphide color, steamed, soured, soaped and dried.

There are many complaints about the tendering of sulphide dyed goods after laying in the cases or in the storehouse and it has been found that this is caused by the presence of free sulphuric acid in the goods and that this free acid owes its origin, not to the presence of sodium sulphide or polysulphide, but to the oxidation of the color molecule or to the oxidation of sulphurous acid from outside sources.

All known methods suggested for securing the fiber from attack by the sulphuric acid possess the common disadvantage in that the salt or compound used for impregnating the dyed material is soluble in water and is consequently removed and therefore rendered useless when the goods are wetted or washed. This can be obviated by taking advantage of the affinity exercised by tannic acid for the vegetable fiber and also its capacity for combining with a suitable salt of lime to form a compound insoluble in water yet very ready to unite with sulphuric acid.

After dyeing in the usual manner with a sulphide dyestuff and washing thoroughly, a treatment of a few moments with a 1 per cent solution of tannic acid on the amount of water at a temperature of 104 degrees F., squeezing, passing through lime water and finally washing, suffices to exercise a very pronounced protective influence. This also adds to the weight, improves the depth and tone of the color so as to allow of the use of 10 per cent less color; it also increases the power of the dyed fabric to absorb starch, and any basic colors topped on this are rendered brighter and faster. Care must be exercised in using this tannate of lime, however, as in some cases it has been known to materially alter the shade or tone of the color. Any suitable salt of calcium, barium or strontium can be used in place of lime water.

The Consolidated Belting Co., with general offices and factory at Philadelphia, has issued Catalog No. 12, an illustrated booklet of 24 pages, which is descriptive of the leather belting, straps and leather specialties manufactured by this company.

Cotton and the Far Eastern Markets

BY A. L. WHITE.

Cotton, possibly more than any other commodity, illustrates the industrial inter-dependence of nations. The United States produces nearly 65 per cent of the raw cotton of the world, and before the war exported about 70 per cent of its production; of this raw material from the United States, Great Britain is the largest importer, and is the most extensive exporter of the finished product. The mills of Great Britain depend for their existence upon export trade, which takes 80 per cent of their manufactures. Of the total of 1200 million dollars worth of manufactures per annum in the world's export trade in cotton goods up to 1914, Great Britain supplied over one-half. Two-thirds of this output was absorbed by the Asiatic countries. Through the workings of the law of supply and demand, the seller and the buyer have equal influence on an industry. Thus, while the United States and Great Britain, as producers of the raw material and of the manufactures, are influential factors in the cotton trade of the world, an equally important factor is the great buyer of cotton goods, the Orient.

As buyers in the world markets, India ranks first and China second in the importation of cotton cloth; China first in the importation of cotton yarn. With a dawning realization that China, in particular, is a field which should be given the most serious consideration, representatives of cotton goods selling agencies in the United States have visited the Orient to look over the ground, and they have expressed their confidence in the opportunities offered.

Already cotton cloth has a large market in China. It is not an article which has to be introduced by expensive advertising and advance demonstration. Since the climate in many sections of the country is mild during the greater part of the year, and because cotton is the least expensive material, most of the people wear cotton clothing. A portion of this cloth, China, itself, can produce, for the nation has an average annual production of raw cotton estimated variously at from 1,500,000 to 2,200,000 bales. Much of this cotton, however, is very low grade. That grown in north China has a short wiry staple of fairly good color. It is not suitable for spinning yarn and is used in Japan for stuffing kimonos and other garments, and in the United States, where it is mixed with wool in the manufacture of blankets. The best cotton raised in China comes from the Yangste Valley and is similar in appearance to the American cotton, the staple is soft and of good white color, three quarters of an inch to an inch in length. Although not as strong as the American variety, it is quite satisfactory for spinning the low counts that are manufactured in the mills of the country.

The Chinese cotton mills depend almost entirely on this native cotton for their supply of raw material. The cotton manufacturing industry in the Orient, as has been indicated in previous numbers of COTTON, is developing rapidly and with marked success. A number of Chinese cotton mills under Chinese management are paying excellent dividends. During the past year, Chinese manufacturers have purchased equipment in the United States for forty-five cotton mills and plan to make a great many more purchases along these lines.

Another industry in China which long ago reached large proportions is the hand-loom weaving. The Chinese are very skillful weavers in both silk and cotton, and the cloth woven on these hand looms not only is exported but is used extensively throughout China. Hand looms are particularly popular because many of the people can use them at home and make their own cloth. Then, too, the big hand-loom weaving establishments pay wages much better than are paid on the farms. However, the Chinese have realized the advantages of the power loom and extensive equipments are being installed as fast as American looms can be delivered.

These industries add to the importance of China's position in the world's traffic in cotton. The hand loom weaving creates a tremendous demand for cotton yarn, which cannot be supplied by the mills of the country. To meet the demand, therefore, the Chinese are obliged to import yarn, most of which comes from India and Japan.

Not only is the cotton market affected directly by China's importations, but indirectly, through the fact that, although China in normal times is the second largest importer of cotton goods in the world, if the prices of raw cotton and, consequently, of the manufactures of cotton become too high for the low individual purchasing power of the Chinese, China can to some extent fall back on its own raw cotton and piece goods produced by its own cotton mills and hand-loom weaving. This withdrawal of a very substantial demand from the markets would naturally affect prices in the other parts of the world.

On the other hand, when prices of raw cotton are at a low level, China enters the market for the American product. This is because, as has already been stated, the cotton which is now raised in China is suitable only for the low counts. Some of the best mills, which make the finer yarns, mix twenty to forty per cent American cotton with the local staple whenever the price of American cotton is low enough or exchange rates are sufficiently favorable so that the American cotton can be bought to advantage.

China, however, is at present of slight importance in the direct trade in raw cotton. But in considering the future of the trade, the place which the Asiatic countries may take in the production of the raw material should not be overlooked. With the present preponderance of production both in quantity and quality in the United States, the competition presented by any other country is, no doubt, now a negligible consideration. The southern planter, however, evinces a growing tendency to reduce production; at the same time, the manufacturers in the United States are enlarging their output of the finished product, and the requirements of these mills are gradually drawing a proportion of the raw cotton from export. While before 1914, the United States exported from 65 to 70 per cent of its raw cotton, in 1919, it exported only a little over 40 per cent. With this reduction in the exports of the raw material from the United States, as one of the London trade journals explains, the mills of Great Britain,

which have hitherto depended largely upon the United States for their supplies of raw cotton, are beginning to realize that some time in the future they may find it necessary, or expedient, to look elsewhere in order to be assured a steady supply. For this reason, a movement is under way in Great Britain to encourage the raising of cotton in the Empire, and to increase and improve the cotton raised in the parts of the Empire already producing it, such as India, which is the second largest producer of the world's supply of cotton.

In China, as in India, an attempt is being made to increase and improve cotton cultivation, for which vast areas of the country are suitable. China is now third in point of production of cotton, but so little of this Chinese cotton is exported that it has only a slight effect upon the markets. An organization is being formed by the Cotton Mill Owners' Association of China for the purpose of promoting and protecting cotton growing. Recently 30 experimental stations were established under the supervision of an American expert, with the idea of trying American seed in order to obtain a better grade of cotton. Some of this work was described in the December, 1919, and April, 1920, numbers of COTTON.

With all their activity toward cotton production, the best the Chinese can hope to do in this direction for many years to come is to supply the mills of their own country. A question of more moment now is what effect will China's cotton mills and increasing industrialism have upon the importation of the manufactured product? Mr. Nieh, president of the Chinese Chamber of Commerce, who has recently visited this country, agrees with the opinion expressed by COTTON editorially, in the January, 1920, number, when he answers the question by saying:

"As more mills are built in China and more of that country's poor are given employment, receiving good wages, the consumption of cotton goods will grow greater than China alone can ever hope to supply. This should mean the doubling and tripling of American exports to China. We cannot hope to keep pace with the development."

It must be remembered that besides the factories and mills which are building, China has vast agricultural and mineral resources, the opening up of which only awaits improved transportation facilities. All of this gives a foundation in wealth for an enormous increase in trade.

In this trade, what place is the United States going to occupy? In the whole cotton traffic of the world up to the time of the Great War, the United States seemed content to furnish the bulk of the raw material only; the manufacturers of cotton piece goods played a very insignificant part. During the war, overseas trade was forced upon the United States, irrespective of the desires of the people. The export business in cotton piece goods grew by leaps and bounds until from supplying less than one-twentieth of the world's exports of cotton goods before 1914, the mills of the country in 1919 supplied one-fifth. Of China's imports of cotton manufactures in 1918 the United States shipped only a very small percentage, while Japan supplied more than 56 per cent. In 1919, however, a great increase occurred in cotton exports from the United States to China, but, even with this increase, cotton manufacturers of this country are not yet occupying the place they should in this business. Room for vast expansion exists particularly in central and southern China. Even in northern China, the stronghold of the Japanese, the American consul to Mukden, Manchuria, reports that on account of the high prices of raw cotton and the labor unrest in Japan, opportunity is now offered for a revival of American business in coarse sheetings and drill, in the manufacture of which American mills excel.

The United States, through the quantity and quality of raw material produced and through the high grade of its manufactured goods, should be one of the leaders in the international commerce in cotton manufactures. The events of the war gave this country an advantage, the effects of which will be lost unless a strenuous effort is made to hold and increase what has already been gained. There has been too much of a tendency on the part of many people in the United States to accept placidly the gifts which chance and the misfortunes of others have thrown their way. It seems to be only by the shock of a slackening in domestic buying that cotton manufacturers are being aroused to a realization of the true value of export trade. Since the buyers in this country, as the head of one large cotton goods commission house has said "have simply gone on strike," cotton goods men are turning their attention to the broadening of their markets by export trade, not for the sake of "dumping" on foreign markets in order to sustain a high price level at home, but to insure the more even flow of business and the steadier operation of the mills, by creating a proper balance in domestic and foreign trade. To succeed in foreign commerce, American cotton manufacturers must undertake it with might and main and with a determined effort to build for the future in the fields which offer the greatest possibilities. One of these fields is undoubtedly China, which, after holding aloof from the world for many years, is now about to take its place among the nations and is already a big influence in the cotton industry. In doing business in the Orient, Americans start with three advantages: the quality of their goods; the reputation for square dealing which the United States has established in China, and above all, as a prominent Chinese said in a recent address:

"The greatest asset which American business men will have in China is the friendliness with which they are regarded by the Chinese."

The Far Eastern field for cotton manufactures is large and promising; because it is, the British, French, Germans and Japanese are bending their thoughts and energies to securing a place in it. Are American manufacturers going to lag behind?

The Newport Chemical Works, Inc., has placed on the market two new direct orange colors which are of the Mikado group: Newport Direct Orange 2 R and Newport Direct Orange 2 R G. These two products are of the same character, excepting that the latter is yellower. They are valuable both as self colors and for shading purposes, and are noted for their remarkable fastness to chlorine as well as splendid resistance to light, acids, alkalies, and soap. They find extensive use in effect dyeing of mixed materials as they leave animal fibers practically clear.

Some people are as anxious to agree with a genius as they are to disagree with a crank.

What the Southern Mills are Doing

THE WEAVE ROOM AT THE REPUBLIC COTTON MILLS, GREAT FALLS, S. C.

It is announced by Secretary Winston D. Adams that the 25th Annual Convention of the American Cotton Manufacturers' Association will be held at the Bellevue-Stratford Hotel, Philadelphia, on Monday and Tuesday, May 30 and 31. These dates were selected by President Allen F. Johnson in order that those members of the association from the South who desire to attend the World Cotton Conference can go from Philadelphia to New York on Tuesday, May 31, and be ready to sail Wednesday, June 1, for Liverpool on the steamer that is to carry the cotton delegates to the conference. The Board of Governors of the Association, at the recent meeting in Charlotte, decided to have the Convention immediately prior to the sailing date. Hence this action. It is stated that the Philadelphia manufacturers and commission people generally are planning such cooperation as to make this 25th Annual Convention one of the greatest in the history of the Association.

Following a course in business training taken by 176 members of the Carolina Cotton & Woolen Mills Company, these members voted to form themselves into a permanent organization to continue their fellowship and study problems common to all, and to arrange for lectures and talks by experts from all over the country. On the night of November 15, the Carolina Cooperative Council, as this organization is known, held its first meeting in Spray, N. C., which was attended by 150 men ranking from manager, through superintendent, foreman, second hand and loom fixers down to section men. The meeting was of an inspirational and social character. Plenty of apples and cigars and cigarettes were provided by the program committee. The feature of the meeting was an inspirational talk by Walt S. Goodwin of New York City. Mr. Goodwin, in his own inimitable style, talked on the traits of success.

A similar meeting was held on December 13, at which Johnson Heywood, of New York, was the principal speaker.

It is the plan of this council to have at least eight meetings during the year, and at each of these meetings to have some well known inspirational speaker talk to the members. It is also planned to have two big social functions during the year. At these meetings the open forum method is to be employed and every member will be given a chance to express his views. Plant production reports will be reviewed and discussed quarterly, and it is expected that eventually the council will interest itself in the important phases of plant and community life. The constitution of the council is as follows:

"The object of this council shall be to promote among its members a better spirit of fraternity and cooperation, and to give each individual member an opportunity for self development. It shall be its further purpose from time to time to study certain definite problems of mutual concern that shall come before it and shall seek in a cooperative spirit to solve these problems in the interest of the entire organization. It shall seek further to bring the executives, the managing personnel and all the leaders in the industry into a closer social relation to the end that there may be a better understanding among them and that there may be developed a spirit of common interest and friendliness among all the members. With this cooperative spirit ever before them it is hoped that the council may provide means for exchanging ideas and suggestions and promoting anything of general welfare."

Industrial night courses have been inaugurated at the Proximity Cotton Mills, Proximity Print Works, White Oak Cotton Mills and the Revolution Cotton Mills, at Greensboro, N. C., this work being done through the cooperation of the mill managements and the State Board of Vocational Education. Sixteen classes will be operated, 160 employees of the mills named receiving instruction at the same time. At the Revolution Cotton Mills the classes are under the direction of Marion B. Hess, who is connected with the official personnel of the mills, while at the other plants the work is in charge of the mill superintendents, with assistant instructors to aid in the develop-

ment of the work. At first only textile arithmetic was taught but the scope of the work is now being broadened materially, courses in textile engineering being planned. All male operatives between the ages of 14 and 50 are eligible for admission in these night schools.

The erection of 70 up-to-date bungalows for employees' use, at a cost of approximately $225,000, has been begun by the Spartan Mills, Spartanburg, S. C. A number of these cottages have already been completed. These houses are of first-class construction, and vary in plan. They have modern conveniences and are constructed of the best grade of material. A cement-like substance, resembling pebble-dash, used on the outside gives them a distinctive appearance. The new houses will be of the same general construction, the approximate cost of each being $3,000.

The Laurens Cotton Mills, Laurens, S. C., have awarded a contract for the erection of 140 houses of similar type.

Construction work has started on the three-story addition to the Anniston (Ala.) Cordage Company. The new section will be 100 feet by 126 feet. The first floor will be devoted to carding, the second floor will be utilized for spinning and the third floor for braiding equipment.

The Consolidated Textile Corporation, LaFayette, Ga., has accepted plans and awarded contracts for an addition to its plant. This will cost $150,000, it is estimated.

The Ken-Tex Cotton Manufacturing Company has been organized at Kenedy, Texas, with a capital of $500,000. The officers are: Robert Burns, president; G. D. Russell, vice-president; C. A. Carothers, secretary-treasurer.

Lanett Cotton Mills, Langdale Cotton Mills, and others of the West Point (Ga.) Manufacturing Company group are having considerable park and planting work done under the supervision and direction of E. S. Draper, landscape architect, Charlotte, N. C. The Dunson Cotton Mills, LaGrange, Ga., has also retained Mr. Draper, to make complete plans, surveys and specifications for village improvement, grading and play-ground development.

Construction work has begun on the yarn mill being erected at Gastonia, N. C., by the Arkray Mills. The main building will be two stories, 300 x 136 feet, with one story section, 170 by 136 feet. There will be a picker building, shipping room, heating plant and switchboard house. The initial installation of equipment will include 20,000 spindles.

The Cherryville (N. C.) Manufacturing Company is expending several thousand dollars in improvements in their mill village. Wide streets have been laid off and worked out, modern tenement houses have been erected and electric lights and water will be installed therein.

The North Georgia Cotton Company, Athens, Ga., has been organized with a capital of $100,000. W. T. Bryan is president; John Hill, vice-president; M. M. Bryan, secretary, and C. D. Cox, treasurer.

The Brazos Valley Cotton Mills Co., West, Texas, has voted to increase its capital stock from $100,000 to $200,000.

The Blair Mills, Belton, S. C., will add considerable machinery to include 2,016 spindles with accompanying cards, slubbers, speeders and bleaching equipment.

The Watts Spinning Co., Greensboro, N. C., has increased its capital stock from $250,000 to $800,000.

Florence Mills, Forest City, N. C., have increased their capital from $200,000 to $500,000.

The New England Mill Situation.

At a series of conferences among New England textile manufacturers it was decided to post notices of a wage reduction of 22½ per cent, to become effective as of January 1, in most instances. The manufacturers were unable to agree unanimously, the chief stumbling block being the fact that even after a reduction of wages was made no guarantee of steadier work could be given. Some manufacturers talked of a 25 or 30 per cent reduction, holding that even the extreme cut would not enable them to make goods profitably at the prices now current.

Fall River manufacturers refused to be the leaders in a wage reduction. They contended that during the war period their operatives acted reasonably, despite the many efforts that were made by radical union agitators to gain a foothold in that city. They will follow any reduction made generally in other New England mills, and New Bedford manufacturers assumed substantially the same attitude.

New England has been in an unparalleled condition of idleness in its textile industries for several weeks past. New Bedford mills have been operating hardly 30 per cent capacity. In Fall River, 14 of the largest mills are closed for indefinite periods. Large plants like the Amoskeag in New Hampshire are operating but three days weekly and with reduced working forces. Some of the large mills in Maine are running but three or four days a week. In Rhode Island the largest units have been running three days weekly. Many plants run three days out of every two weeks.

Coupled with the idleness in cloth mills is the idleness in yarn, knit goods, and hosiery mills, not to speak of an idleness in finishing plants of all sorts amounting to at least 60 per cent of capacity. The machine shops are steadily cutting down production by laying off men.

At this time, it does not seem as if the end of idleness had been reached. One reason is that there are still few signs of early buying in a volume that will warrant mills in trying to restore normal working schedules. Many manufacturers are of the opinion that a restoration of production will not be seen until late in March and possibly not until the latter part of April. They are convinced that mills will have to run without profit for many months to come, and they base this view of the future on the great shock to buying power that has occurred in agricultural regions.

The conditions prevailing in raw cotton have been distinctly disappointing to many manufacturers who are looking beyond the seasonal difficulties and who have been working consistently for four or five years past to encourage better planting conditions. They are anxious that the grades of American cotton shall be improved, and with that end in view, many have been backing the plans for national warehousing. They believe that the buying power of the country is great enough to warrant a minimum of 15 cent cotton, and in the run of the years they believe that value will be sufficient to stimulate wider interest in better grades and more intensive cultivating.

Unfortunately for the good of the crop for another year, the break in cloth prices this year began to grow serious in June and July, so that manufacturers found themselves carrying stocks of cotton sufficient to supply them during the long period of idleness that has since struck in. The

four months' receipts of cotton in the five largest centers of New England, to December 1, were but 229,816 bales, compared with 357,823 in 1919, and 359,879 in 1918. After taking severe losses on stocks in hand, manufacturers have not been in a position to buy abnormally for future use, even at the very attractive prices that have been offered from time to time in the past two months.

Another feature of the cotton situation with the mills has been the very low prices at which fine staple cottons have been offered compared with any prices named in the past three or four years. Owing to the absence of the automobile trade as a competitor for long staple cotton, it has been possible for manufacturers to get excellent selections of staples. But in the absence of cloth orders, and the carried over supplies, the buying power has been light, with the result that mills have been unable to take advantage of a situation that is tempting them continually. There has been some buying on the part of a few mills but no such volume of buying as prices have warranted.

New England manufacturers as a whole have refused to lead the way in cutting prices. In fact they have followed slowly, so that by the middle of December mills were holding many goods from 10 to 20 per cent above the market. They have been willing to sell spot goods to some of their best customers but have had no accumulations they cared to offer at cut rates. The credit conditions have held many of them back. They have frequently received firm offers from buyers with whom they traded freely in the past two years and in a number of cases they have flatly refused to sell. They have preferred to keep their goods rather than take the chance of entering a bad debt on the books, or running the risk of further cancellations or claims.

The financial conditions of the mills are good, and in fact better than they have ever been in a time of trade reaction. In the fourth quarter of their fiscal year, New Bedford mills distributed an average of $1,532,035 in dividends, or a rate of 2.7 per cent. This is only slightly half of what Fall River stockholders received for the same period, but it will be recalled that fine goods mills began to lose business early and found it harder than print cloth mills to secure new business after the slump occurred. One cause was the influx of imported fine goods.

Before the end of the year selling agents expect to make a further revision in the prices of standard trade-marked fabrics such as ginghams, wide sheetings, bleached goods, tickings, and other domestics. In an effort to postpone the naming of new and lower prices, many agents sold goods "on memorandum." The large printers of percales held away from this policy for a month but were finally compelled to make the concession to their jobbing customers. One of the evils resulting from this method of selling was the placing of goods in jobbers' hands which they could use for further price reductions to retailers, in anticipation of the reductions agents will make to them when the memorandum goods are charged up.

It was found impossible for agents to agree among themselves to abandon this policy of selling goods, due perhaps to the needs for money felt by some traders. The jobbers as a whole have not asked for goods on memorandum, but the instances where they did ask were of a conspicuous character, and the plea made was that it was necessary to let the trades have goods until they could recover from the shock of cutting down their inventories.

Print cloths dropped to a basis of 7½ cents for 38½ inch 64 x 60s but rallied in the early part of December to 8¼ cents and then fell back again to 8 cents. It was stated that a few of the large converters and printers concluded that an attempt to stabilize the markets should be made before December 15, and an effort should be made to prevent the constant raiding of prices by a few speculative bears in print cloth circles. Prices dropped far below any cost of production in sight among New England mills at present. While it is claimed that a few southern mills can make print cloths at 17 cents a pound above cotton, most New England manufacturers believe that a basis of 25 cents a pound above cotton is safer to rely upon as a basis of future trading.

This drop in print cloths necessarily affected the values of all bleached and brown goods priced some time ago for the jobbing trade. The drop in cotton, and the cut in labor costs, also make it imperative that gingham prices shall be reduced. For some time, Amoskeag staple ginghams have been quoted at 20 cents while southern staples of the same construction have been offered at 11½ cents. A similar condition has existed in tickings that have been quoted in the South on a basis of 22 cents while Amoskeag lines are at 27½ cents. While these high prices have remained jobbers have been asking for revisions and all of them have not been content with offers to place goods on memorandum. They have desired to buy at prices they will know to be safe and which will close the transaction. Some agents have stated that a revision will take place before Christmas or just as soon as notices of wage reductions have been posted in the mills.

While it is true that yarn mills in all sections have felt the force of the readjustment violently, it is probable that no section has suffered more than the fine yarn mills, especially those engaged in supplying yarns for tires or other purposes related to automobile work. The chief building of mills in recent years in New England has been in the direction of automobile supply fabrics and yarns and the utter collapse of that industry found mills unprepared. Recovery has been very slow and it does not look at this time as if it will come much before spring.

The knit goods mills were also very hard hit, the reaction coming at a time when spring goods should have been marketed. Many of the best equipped knitting mills are closed or running on such short time or to such small capacity, that their product is negligible. In addition the whole section is filled with many small miscellaneous tape, braid, and specialty mills, using yarn as the raw material. Add to this the absence of business from shoe and other manufacturers and the plight of the New England mills can be appreciated.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, December 18, 1920.

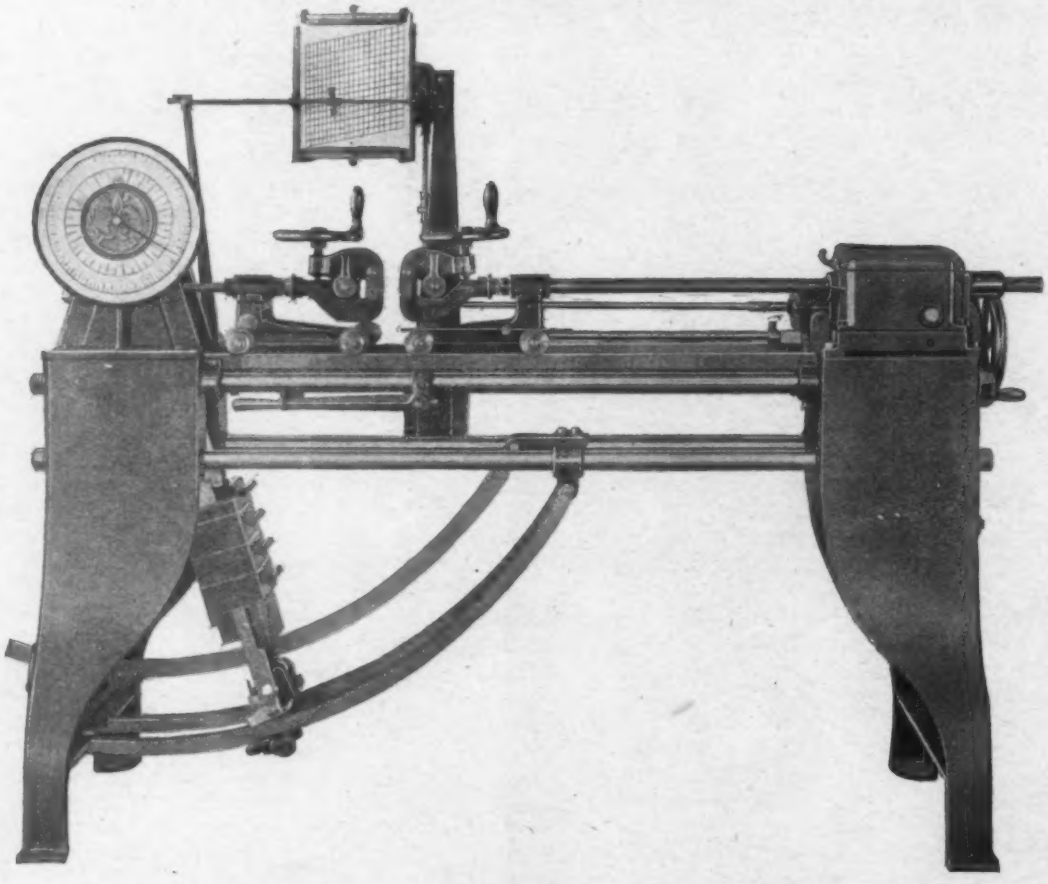
The market continues to sag under the depressing influences of official confirmation of the larger of crop estimates, small takings by spinners of the world and because of no improvement of consequence in the trade demand.

On December 13th the government, in final estimate, placed the probable production of cotton this year at 12,987,000 bales of 500 pounds gross weight exclusive of lin-

SCOTT TESTERS

The sensitiveness, accuracy and simplicity of Scott Testers combined with their heavy construction makes them equally well suited for routine mill work and laboratory experiments.

By their use the closest relations between different plants or laboratory and mill can be maintained.



This cut shows our horizontal type tester equipped with autographic recorder. The great value of permanent chart records is universally realized and tests so recorded on this machine are indisputable.

Complete information upon request.

HENRY L. SCOTT & COMPANY

PROVIDENCE, R. I.

ESTABLISHED 1899

ters, compared with 11,421,000 bales last year, which is the largest yield since 1914.

Compared with last year the indicated crop by states is as follows: Virginia, 19,000 vs. 22,523; North Carolina, 840,000 vs. 830,293; South Carolina, 1,530,000 vs. 1,426,-146; Georgia, 1,400,000 vs. 1,659,529; Florida, 18,000 vs. 15,922; Alabama, 660,000 vs. 713,236; Mississippi, 885,000 vs. 960,886; Louisiana, 380,000 vs. 297,681; Texas, 4,200,-000 vs. 3,098,967; Arkansas, 1,160,000 vs. 884,473; Tennessee, 310,000 vs. 310,044; Missouri, 85,000 vs. 64,031; Oklahoma, 1,300,000 vs. 1,016,129; California, 150,000 vs. 56,-107; Arizona, 110,000 vs. 59,849; all other states 15,000 vs. 4,947.

Meanwhile spinners of the world continue to take much less cotton than for the corresponding time last year, as will be seen by the following comparatives in bales:

	This Season.	Last Season.
North and Canada	527,000	1,278,000
Southern mills	1,333,000	2,050,000
Europe and Asia	1,790,000	2,096,000
Total, world	3,650,000	5,424,000

To give an idea as to how fast mill takings are shrinking compared with last season, spinners takings by the world of American cotton last week, which are included in the above, were only 237,000 bales vs. 497,000 for the corresponding week of one year ago.

Since the world's takings last season amounted to 12,-855,000 bales of American cotton, and as takings so far this season figure 1,774,000 less than to even date one year ago, takings for this season are now running on a basis for the whole season of only 11,081,000 bales, with prospects of the basis decreasing further in the future.

This is the result of trade depression, particularly in textiles, the world over, forcing American mills to run on short time, half time in many instances, and British and French spinners to adopt half time.

An insight as to how heavy American mills are curtailing production of goods is obtained from returns, as per Census Bureau report, showing consumption of raw cotton in the United States during November to have been only 361,000 bales vs. 516,000 for corresponding month last season, of which 29,000 bales were linters against 25,-000. From August 1st to the close of November American mills consumed only 1,823,000 bales compared with 2,132,-000 for the corresponding period one year ago, of which 150,000 bales were linters vs. 96,000.

Stocks in the United States November 30th were as follows:

	This Year.	Last Year.
Mill stocks	1,124,000	1,642,000
Stock in public storage ..	5,070,000	4,063,000
Total	6,195,000	5,705,000

A redeeming feature of the situation is that while the stock in public storage is 1,005,000 in excess of last year, the total stock in the United States, by reason of mill stocks being 518,000 smaller than one year ago, is only 489,000 bales larger than in 1919.

Meanwhile an effort, likely to be successful, is being made in Washington to revive the War Finance Corporation in the interest of the farmers, and large private export finance corporations have been organized, having a potential business capacity in excess of one billion dollars, and are expected to begin operations with the opening of the new year.

In the meantime a determined campaign is being conducted in the South to force a reduction in acreage next spring that will permit of the making of only about one-half of last year's crop. Bankers and merchants are backing the acreage reduction movement and are confident of success since this program will likely be made possible by the restriction of credit to farmers.

In The Chemical Market.

While dyes and textile chemicals have followed the course of other commodities, developed black is to continue high, according to a person close to large dyestuff interests. The cost of plants hurriedly built when the country was confronted with a dye famine is yet to be written off, it is explained. This is held as figuring in the cost of post-war output, and it is stated it will be some time before developed black can be produced as low relatively as most of the standards.

Firm prices of sulphide of soda, used in dyeing sulphur black, and glauber's salt, commonly used by all dyers, are to be looked for, a leading chemist says. These are said to be affected by the diminished production of salt cake, of which they are a by-product. Salt cake in turn is in lessened supply because of the curtailment in the output of muriatic acid, from which it is derived, and for which there has been a sharp decline in demand.

Formaldehyde is one of the textile chemicals in which there has been a radical decline, the price dropping from 65 cents six months ago to about 25 cents, a recent bona fide quotation being 27½. A drop in wood alcohol, to two dollars a gallon from four, because of shrunken demand for export, is given as the cause of the decline in formaldehyde.

The alkalis—caustic soda, soda ash and sal soda—are down, dealers having been caught with large stocks which they were forced to liquidate. They had been hoarding in expectation of another scarcity.

Textile oils and soaps have had declines due to the drop of vegetable oil prices.

Germany is managing to get some of the chemicals into this country, notably formic acid, which has been coming in the familiar old carboy. Recently a shipment of potassium bromide of seeming uncertain origin was examined by a chemical expert and found to be of German origin.

It is intimated in dye and chemical circles that some of the smaller manufacturers who suddenly sprang into existence during the unprecedented rush will not be able to weather the storm, and the feeling prevails that the survivers will be in a commanding position in competition with foreign interests.

The general sales office of the National Oil Products Company has been removed from 220 Broadway, New York, to the home office of the company at Harrison, N. J., the change taking effect December 1. The company states that by locating the sales department at Harrison in conjunction with the factory, they believe it will function to better advantage and will establish a better coordination of all departments which will react for the benefit of their customers.

Notes About Men You Know.

W. PAUL BOLEN.

W. Paul Bolen is now representing the Lovingood Company, of Atlanta, handling their well known and extensive line of shipping room and factory supplies, having taken up his work with this company on January 1. He will cover the North Carolina and South Carolina territory and will devote the greater part of his attention to the textile trade. Mr. Bolen was for two years, from 1914 to 1916, cloth room man and finisher at the Stonewall Cotton Mills, Stonewall, Miss. Leaving this position he became associated with his father, W. H. Bolen, as salesman for the Newbert Color Co., of Boston, covering the southern territory. After one year in this position he enlisted in the U. S. Navy and served in the troop transport service, seeing overseas duty. Upon his discharge from the Navy, Mr. Bolen entered the employ of the soap department of Swift & Co., Chicago, handling their general line of soaps in the southeastern territory. He was changed later, however, to handling soaps for the textile trade exclusively. Mr. Bolen's experience has given him a wide acquaintance in the textile field, in which direction he will apply the greater part of his energies in his position with the Lovingood Company.

C. K. TAYLOR, superintendent of the Mobile Cotton Mills, McComb City, Ala., is the proud father of Charles Kersey Taylor, Junior, born November 12, 1920. Mr. Taylor will, no doubt, bring his heir up to follow in his footsteps, and an announcement a few years hence will probably be to the effect that the son will be assistant superintendent to his father.

ARTHUR T. SMITH, who for nearly 30 years resided in the South, serving five years as superintendent of the Exposition Cotton Mills, Atlanta, and 23 years as superintendent of the Langley (S. C.) Mills, and who in 1914 identified himself with the B. B. & R. Knight Company, of Providence, R. I., serving as superintendent at the Nottingham Mills, Providence; Clinton Mills, Woonsocket, R. I.; Arctic Mills at Arctic, R. I.; Manchaug (Mass.) Mills, has now been appointed superintendent of the Pontiac Mills, Pontiac, R. I.

HARRY J. STULZ, secretary of the United Chemical Products Corporation, was, on November 20, 1920, married to Miss Edna Mabel Williams, of Rochelle Park, N. J. Editorial correspondence received from Cuba shortly after the marriage indicates that Mr. and Mrs. Stulz spent their honeymoon visiting the island republic.

ALLEN JONES, purchasing agent for a number of southern cotton mills, has moved his purchasing organization from Asheville, N. C., to 299 Broadway, New York City, from which point the organization will conduct its purchasing in the future. Mr. Jones states he feels that in New York he will be put in closer touch with the situation and for this reason has made the change. Among the mills included in the group for which Mr. Jones does the purchasing are the French Broad Mfg. Co., Asheville, N. C.; Palmetto Cotton Mills, Columbia, S. C.; Trainer Spinning Co., Chester, Pa., Martell Mfg. Co., Egan, Ga.; Middleburg Mills, Batesburg, S. C.; Valley Falls Mfg. Co., Spartanburg, S. C.; Asheraft Cotton Mills, Florence, Ala.; Lexington (S. C.) Mfg. Co., Saxe-Gotha Mills, Lexington, S. C., and the Beaver Mills, North Adams, Mass.

WILLIAM F. BARTELT, superintendent of the Star Textile Mills, Frankford, Philadelphia, was on Saturday, November 20, 1920, married to Miss Mildred C. Spencer, Oak Lane, Philadelphia. The ceremony was performed at the Oak Lane Baptist Church, by Rev. David Spencer.

THOMAS B. WHITTED has been appointed southeastern representative for the Fletcher Works, Glenwood Avenue and Second St., Philadelphia, and will handle their line of textile machinery. His offices are in the Realty Building, Charlotte, N. C.

S. P. BLAND has resigned as overseer of weaving at the Holt, Gant and Holt Cotton Manufacturing Co., Elon College, N. C., and has accepted the position of overseer of weaving, slashing, beaming and drawing-in at the Glen Raven (N. C.) Mills. Mr. Bland was formerly with the Roanoke Mills, Roanoke Rapids, N. C., as general overseer of weaving.

MARION R. CASEY has resigned as night overseer of weaving, Calhoun Mills, Calhoun Falls, S. C., and is now loom fixer at the Ware Shoals Manufacturing Co., Ware Shoals, S. C. Mr. Casey is the inventor of the Casey cam device, the Casey adjustable rocker shaft and parallel bearing, and the Casey self-tightening gear and pulley attachment.

CHARLES H. HYDE, for a number of years assistant general manager of the thread manufacturing plant of J. & P. Coats, at Pawtucket, R. I., is now superintendent of the Mount Vernon (N. Y.) plant of the North American Dye Corporation. This corporation, which also has a plant at Toronto, Canada, manufactures the well known "Sunset" soaps which are used extensively for trade and household purposes.

J. L. MATTHEWS, formerly overseer of spinning at the Montgomery (Ala.) Cotton Mills, is now superintendent for the Pinckard (Ala.) Cotton Manufacturing Co.

Time was when you liked to take a chance on a lucky packet, but you do not use that method in business.

Warren Soap and Warren Service combine the accumulated experience of a large part of the textile trade during fifty years with the most up-to-date scientific investigation.

The Warren Soap Manufacturing Co.

77 Summer Street, BOSTON, MASS.

Established 1870 **Incorporated 1890**

STRAIGHT LINE METHODS

Business Graphics

If you would make Figures talk, Chart them

Graphic Charts are moving picture stories of business activities. They are figures—illustrated. They picture the vital facts of your business, as those facts are revealed by figures—compare them, weigh them, measure them.

Graphic Charts illuminate the most complicated problems. Their logic is the logic of mathematics. They are simple. They interest. They convince instantly.

The value of your Graphic Charts depends on the just application of correct figures and the use of correct chart forms. Perfect accounting must be their base.

Only expert accountants, trained in engineering principles and with long experience in Graphics, may be entrusted to set these vital business pictures. Prepared by novices, Graphic Charts are misleading—untruthful—dangerous.

In this connection:—

ERNST & ERNST

offer a highly specialized Graphic service—in the preparation of Graphic Charts or the establishment of a competent Department of Graphics in your business.

Our detailed Pamphlet on the subject, to Executives

ERNST & ERNST

AUDITS - SYSTEMS

TAX SERVICE

NEW YORK	CHICAGO	CLEVELAND	CINCINNATI	NEW ORLEANS
PHILADELPHIA	MINNEAPOLIS	BUFFALO	INDIANAPOLIS	DALLAS
BOSTON	ST. PAUL	PITTSBURGH	TOLEDO	FORT WORTH
PROVIDENCE	ST. LOUIS	DETROIT	ATLANTA	HOUSTON
WASHINGTON	KANSAS CITY	GRAND RAPIDS	RICHMOND	DENVER

STRAIGHT LINE METHODS

How Other Men Manage

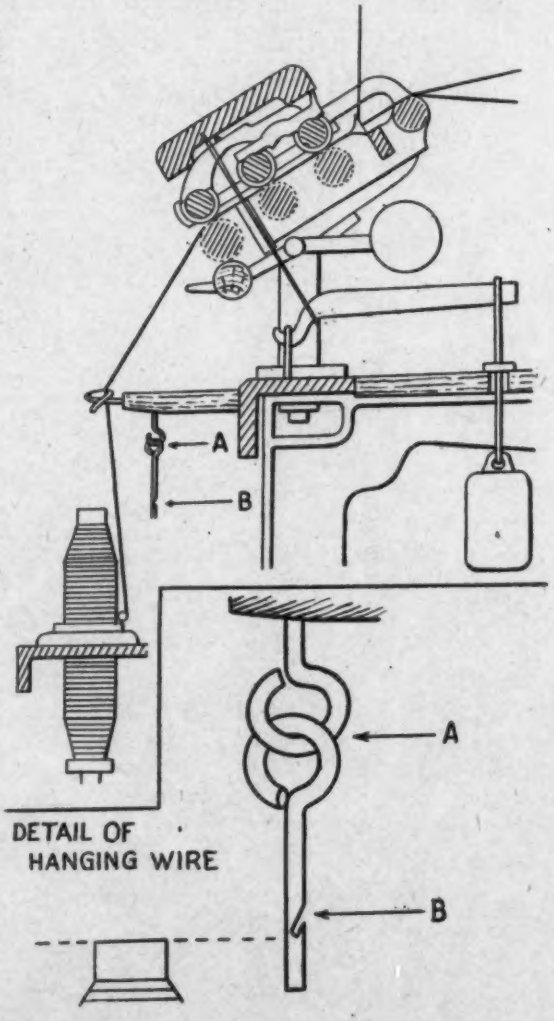
Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

A Safety Device for Hard Ends.

EDITOR COTTON:

There is nothing so detrimental to ring spinning as hard ends that come from the drawing rolls and sweep down a dozen or more ends. Kink arresters or separators help a little, but nothing will give the service that the hanging-wire under the thread board will give. Different types of thread wires will help also, but when the end breaks when the traverse is at its lowest position, all thread wires are useless.

In the sketch of the hanging-wire idea, the hanging-wire A consists of two lengths of wire, the length depending on the distance between the thread wire and the top of the bobbin, having two eyes at A. (See detail sketch.) B is a notch in the hanging-wire to catch all kinky yarn.



We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

This notch in the hanging-wire should be even with the top of the bobbin. The hanging-wire is free to swing in all directions. If so desired, a screw-eye may be used to connect the hanging-wire to the thread board.

When a hard end comes through the rolls, or when the yarn snarls, the heavy end will fly outward after leaving the guide wire in the thread board, and of course, will become wrapped around the hanging-wire, as the bobbin revolves and adds twist to the broken end a pull is created and if there was no notch at the bottom of the hanging-wire, the snarled portion of the yarn might be pulled from the hanging-wire and sweep down many more ends, but the notch holds the snarled portion, and instead of the snarled portion being pulled from the hanging-wire, the end is broken between the wire and the top of the bobbin, thus many ends are saved from being swept down.

Wash (Conn.)

Settings, Drafts and Twist.

EDITOR COTTON:

Replying to Contributor No. 14 on his latest comments in the November number, I wish first to take up the matter of roll settings. In his original article in the September number, he says, "The setting of the steel rolls on this weight of sliver should exceed in the distance from center to center of the rolls ⅛ to 3/16 inch longer than the staple, although it is sometimes necessary or rather customary, to have the third and fourth rolls set a little wider than this."

If I did not know, as every practical mill man does, that the setting from center to center, between the second and third and also between the third and fourth rolls is always wider than the setting between the first and second rolls I should very likely be led to infer from the article in question that the setting between all the rolls from center to center was generally the same but that sometimes a slight deviation was made from this set rule.

In answer to my comments in the October issue, Contributor No. 14 makes the statement that if the numbers were run separately, then the rolls could and would be better set, to have the two back rolls open some, and that all mill men are aware that the settings on light work run

closer than they do on heavier work. In answer to this I wish to say that all mill men are aware that the settings run closer on light work than they do on heavy work, but that does not change the fact that the distance from center to center of the rolls is *always* greater between the second and third, and between the third and fourth, than it is between the first and second, regardless of the numbers being run or the weight of the sliver being drawn.

In answer to his remarks on slubber drafts I wish to point out the fact that if a draft of 4.10 was used on the slubber when making 12s yarn from a 57 grain sliver, the drafts used on the intermediate, roving and spinning frames would be altogether out of proportion to the slubber draft being used, as I will proceed to show.

The range of drafts on the slubber, intermediate, roving and spinning frames would be as follows: slubber, 3 to 5; intermediates, 4 to 6; roving, 5 to 7; spinning frames 8 to 12 (double roving). Now take a 57 grain sliver which will equal .146 hank, the only formula possible would be as follows:

$$\frac{.146 \times 4.10 \times 4 \times 5 \times 8}{2 \times 2 \times 2} = 11.972 \text{ or 12s yarn.}$$

From this formula it can be easily seen that the drafts following the slubber are the lowest ones that could possibly be used and when it is noted that the draft on the intermediate is shorter than the one on the slubber, it does not argue for the quality of the yarn to be produced.

The last question to be taken up is the one on turns per inch and if Contributor No. 14 will look over my comments in the October issue, he will find that I did not question the item of one turn per inch, but merely stated that he did not mention the fact that the length of staple being used would very largely govern the turns per inch. While on this subject I wish also to call his attention to the fact that he now makes the statement that his article was written on a 7/8 to 1 inch staple, whereas if he will look up his original article in the September issue, he will find that he says "These numbers will require a grade of cotton running about 'middling,' with from 3/4 to 1 inch staple."

Benjamin (Conn.)

Favors Two Processes of Drawing.

EDITOR COTTON:

The ultimate aim of every mill is production and quality. And that mill which possesses the highest efficiency in both of these requirements at minimum cost is the one that is classed rightly as the leader in its particular line of endeavor—which carries with it its just rewards.

By quality is meant uniformity or likeness of the same product produced and to that end all mills work to secure "even-running work," and from it better quality is obtained and better satisfied help retained.

The following facts and figures cover a study of variations between the first and second drawing processes covered in a number of mills running about the average work in sheetings, drills and flannels.

Referring to Fig. 1, we see the result of a series of tests made at one time at a mill making about 24s warp yarn. The method used consisted of taking six cans at random from different drawing frames of the first process. From each can starting at the top was taken twelve separate yards of sliver and each yard of sliver was weighed separately. This made seventy-two tests on the same lot of cotton at the same time from the first drawing. This was repeated for the second drawing and the lightest yard was subtracted from the heaviest yard in each can giving the maximum variation in that can.

It will be noted that the maximum variation in one

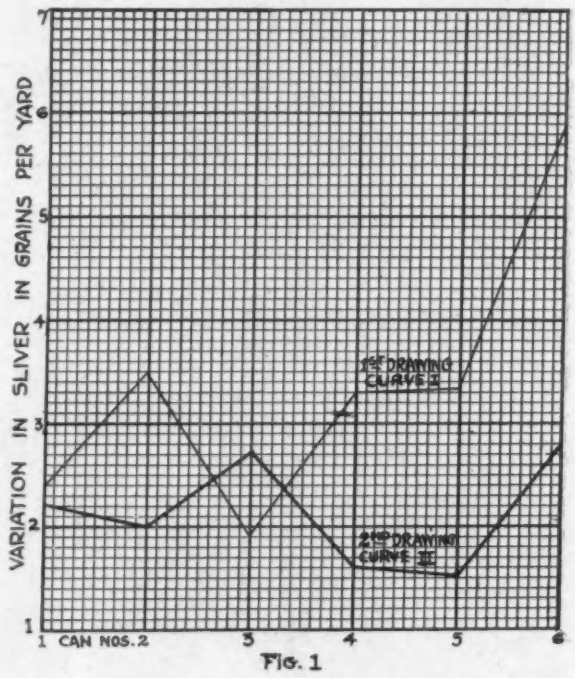


FIG. 1

can in the first drawing process was 5.9 grains while the maximum variation in the second drawing process was only 2.8 grains. Also the fact that the minimum variation in a single can in the first process was 1.9 grains while in the second drawing the minimum variation was 1.5 grains.

These tests covered the use of three makes of drawing frames, viz., Lowell, Pettee and Whitin. For comparison the following table is given of the actual results at this mill.

FIRST DRAWING.

Standard Weight 60 Grains.

Can No.	1	2	3	4	5	6
Frame	Lowell	Pettee	Whitin	Whitin	Whitin	Whitin
Maximum Variation	2.4 gr.	3.5 gr.	1.9 gr.	3.3 gr.	3.3 gr.	5.9 gr.

Maximum Variation in entire six cans 8.2 grains.

SECOND DRAWING.

Standard Weight 62 Grains.

Can No.	1	2	3	4	5	6
Frame	Lowell	Pettee	Whitin	Whitin	Whitin	Whitin
Maximum Variation	2.2 gr.	2.0 gr.	2.7 gr.	1.6 gr.	1.5 gr.	2.8 gr.

Maximum Variation in entire six cans 2.8 grains.

It is readily concluded that the second drawing is by far the more uniform and since the subsequent doublings and subsequent drafts favor the second drawing, for each variation in the sliver is multiplied many fold, also the drafting in the further processes far exceeds the doublings in these processes. So that we will have a yarn with an evener product which will naturally break higher and as a

In any Export Emergency

Whether the grounds for refusal are justified or not, your export shipment needs special safeguards when your documentary draft on a foreign buyer is dishonored. It is in just such emergencies that the service departments of the Irving's Foreign Division demonstrate their capacity and initiative.

Not only is the refusal reported to you at once, but immediate provision for clearing, warehousing and insuring the merchandise is made through the Irving's local correspondent. Then the Foreign Division, consulting with you and acting under instructions, arranges for sale of the goods or for their disposal in some other approved way.

A collection anywhere over-seas is expedited by direct transmission of the draft and its accompanying documents to a carefully selected correspondent bank on the spot, familiar with local conditions and able to protect your interests at every stage of the transaction.

IRVING NATIONAL BANK

WOOLWORTH BUILDING, NEW YORK

result less twist can be inserted with a corresponding increase in production.

To further supplement the figures given, there is given below a summary of tests made at four mills giving the variation in per cent found by dividing the standard weight into the variation.

	Standard Silver		Max. Variation		Per Cent Variation	
	1st. Drwg.	2nd. Drwg.	1st. Drwg.	2nd. Drwg.	1st.	2nd.
Mill No. 1	60 gr.	62 gr.	8.2 gr.	2.8 gr.	13.7	4.5
Mill No. 2	74 gr.	81 gr.	7.9 gr.	6.1 gr.	10.6	7.5
Mill No. 3	50 gr.	52 gr.	6.5 gr.	4.5 gr.	13.0	8.6
Mill No. 4	65 gr.	72 gr.	11.1 gr.	8.0 gr.	17.1	11.1
Average	62.2 gr.	66.7 gr.	8.4 gr.	5.4 gr.	13.6	8.0

We see readily that out of a test of four mills covering widely different products that the uniformity of the second process of drawing is prevalent, for something like 5.6 per cent, and 5.6 per cent more evenness means just as much in breaking strength and a consequent reduction in twist with a resultant increased production which is the desired goal.

Pat (N. C.)

The Greist Manufacturing Company of New Haven, Conn., for the past fifty years the largest manufacturers in the world of sewing machine attachments, has recently purchased the loom drop wire business of the Frank Mossberg Company of Attleboro, Mass., makers of the Diamond "M" brand wires.

This is the second drop wire business to be taken over by the Greist Company—a short time ago they purchased the Woodbury business and are now one of the larger manufacturers of drop wires in this country. They are represented in New England by Boyd's Textile Bureau of Providence, Rhode Island, and in the South by the G. G. Slaughter Machinery Company, Greenville, South Carolina.

What Settings Would You Use?

EDITOR COTTON:

I would like to ask the readers of your paper a few questions concerning the breaking strength of yarns:

1st. I have vertical openers and use only two processes of picking. In my breakers I have 3 blade beaters running 1,050 r. p. m. What distance should the beater be set from the feed roll? The finishers are equipped with Kirschner beaters running about 900 r. p. m. What distance should the beater be set from the feed roll? Which will give the better results, the blade or the Kirschner beater?

2nd. I am making a 14-ounce finished lap, from which is produced a 55 grain card sliver. I wish some one would give me the complete card settings for this class of work. I have plenty of cards which eliminates the necessity of fast carding? Which change gears would give the best results, range 22 to 28 teeth?

3rd. I have two processes of drawing, but it is necessary to run it a little fast. The finished drawing weighs about 64 grains from which is produced a .48 hank slubber roving. Give the best roll settings for drawing and slubbers. We make 1.25 hank intermediate roving from which we spin 7s and 8s yarns, single roving used, which will produce the best results, 1.25 or coarser roving? We are using middling cotton 7/8 to 1 inch staple.

I would like very much to hear from some good carders on this subject, and will appreciate any help you may give me in getting the information. Supt. (Ga.)

"COAL TO DYESTUFF"

NEWPORT COLORS

Vat Dyes

Newport Anthrene Dark Blue B O Paste
Newport Anthrene Brown B B Paste
Newport Anthrene Green B Paste
Newport Anthrene Blue G C D Paste
Newport Anthrene Black Paste

These are all now available as pastes and correspond in other respects to Indanthrene colors of the same designation.

Others which will be ready in the next few weeks are

Newport Anthrene Yellow G Paste
Newport Anthrene Blue G C Paste
Newport Anthrene Blue R S Paste

When you see our slogan, remember what it means:

"COAL TO DYESTUFF"—
NEWPORT ALL THE WAY

Newport Chemical Works, Inc.
Delaware Corporation
Passaic, New Jersey

BRANCH SALES OFFICES
BOSTON, MASS. PHILADELPHIA, PA.
PROVIDENCE, R. I. CHICAGO, ILL.
GREENSBORO, N. C.

RUSCO

POWER

With every essential for maximum delivery —

RUSCO SOLID WOVEN **BELTING**

is economical to use. It is impervious to water, oil, steam and dirt—strong, flexible, enduring.

RUSCO is equally suitable for conveyor, elevating or transmission uses.

The Russell Manufacturing Co.
526 Russell Avenue, Middletown, Conn.
Branch Offices:
New York, 349 Broadway
Atlanta, 608 S. Forsyth St.
Chicago, 1438 Mich'gan Ave.
Detroit, 162 Jefferson Ave., E.

An Experience With Hard Water.

EDITOR COTTON:

At a mill where I was employed recently as dyer, we had been having considerable trouble for some time with streaks and off shades on the goods which of course caused many seconds, also increasing the unit cost of production. Being urged by a desire for more economical operation and a better product, the mill decided to install a dyeing machine as a remedy and, accordingly, a package dyeing machine was purchased.

After the first batch of work had been run through the new apparatus and taken out, it was the worst I had ever seen. The yarn around the center of the spool was all smutty and dusty and harsh. Some blamed the dyer for this bad work, and the dyer "passed the buck" on to the machine. The machine was loaded up again and produced the same results.

We knew that the water we used was hard, yet no one thought to place the blame there. Finally, some one who knew that the water in the New England section was softer than ours, and that the machine gave good results there, suggested that we investigate the water supply and see if the trouble could be attributed to that source. We made a test of the water and found 15 degrees hardness—lime and magnesia, in addition to quite a quantity of iron. To remedy this we called in some chemists and first softened the water with lime and soda. This helped some, but there was still quite a trace of harshness in evidence in the yarn. It served, however, to show that the trouble was not with the machine nor with the dyer. We then installed a water softening apparatus, which took away the last trace of hardness from the water and by straining the dye solution, the work came through almost perfect.

This is not an advertisement for any machine, but the recitation of an actual experience and the remedy utilized for overcoming bad work. So long as the yarn was dyed in the skein, the effect was not so pronounced, but when we put in the package processing machine, it filtered the hardness out onto the yarn, even a slight hardness showing up bad. The water had been the trouble with our dyeing all along, but now we had placed our mill on an equal with those blessed with soft water, if not better, as our water was put under control.

After our troubles had been forgotten and everything was going along fine, there occurred a humorous incident which I am sure dyers will appreciate, and which indicated that with even the best equipment off shades can sometimes occur. The dyer was away on his annual vacation, and one day the master mechanic, who was working in the dye house, overheard the second hand, an Italian, who was sampling a batch of olive drab in the machine, mumble to himself: "Son of a gun vacuum machine make um too green; make leetle brown, I fix him next time" as he went off to the drug room. L. A. W. (Ga.)

Manney-Steel Company, 237 Chestnut St., Philadelphia, is sending out to its friends and customers a 1921 calendar designed in a useful manner. The calendar shows each month of the year on a separate sheet with the preceding month and the succeeding month, which arrangement is of much assistance to those using it with regard to shipments, etc. The southern office of this company is at Cherryville, N. C.

Accelerate Textile Inventions.

EDITOR COTTON:

The machinery used in our cotton mills has not advanced in proportion to mill management. Therefore, it will, at this time, be well to consider some of the reasons for this lack of improvement and see if action cannot be stimulated to bring about perfection or as near perfection as is possible.

We have improved the working conditions for our help, and have improved the operatives themselves by education, but we should not pat ourselves on the back for what has been done, rather, we should be alive to what we have not done and take steps to do these things.

The science of textile manufacturing is one of the oldest, if not the oldest known, and for the sake of comparison, consider some of its younger contemporaries and startling facts are revealed. The automobile was first heard of about 20 years ago, and from those early "one lungers" that chugged along the road see what has developed. The style has changed, but that is not for us to consider at this time, it is the mechanical improvement that interests us. About fifteen years ago, we listened to a cylindrical record rasping out a tune through a tin horn, but now we listen to a phonograph which gives out music almost indistinguishable from the original. When the Republic sank off the coast of Maine, we listened with wonder to the stories of the C. Q. D. message which went out through the air and saved the lives aboard that boat. Today when a man is miles out at sea, he holds verbal conversation with a man on land. These are simply striking examples, but many more could be enumerated.

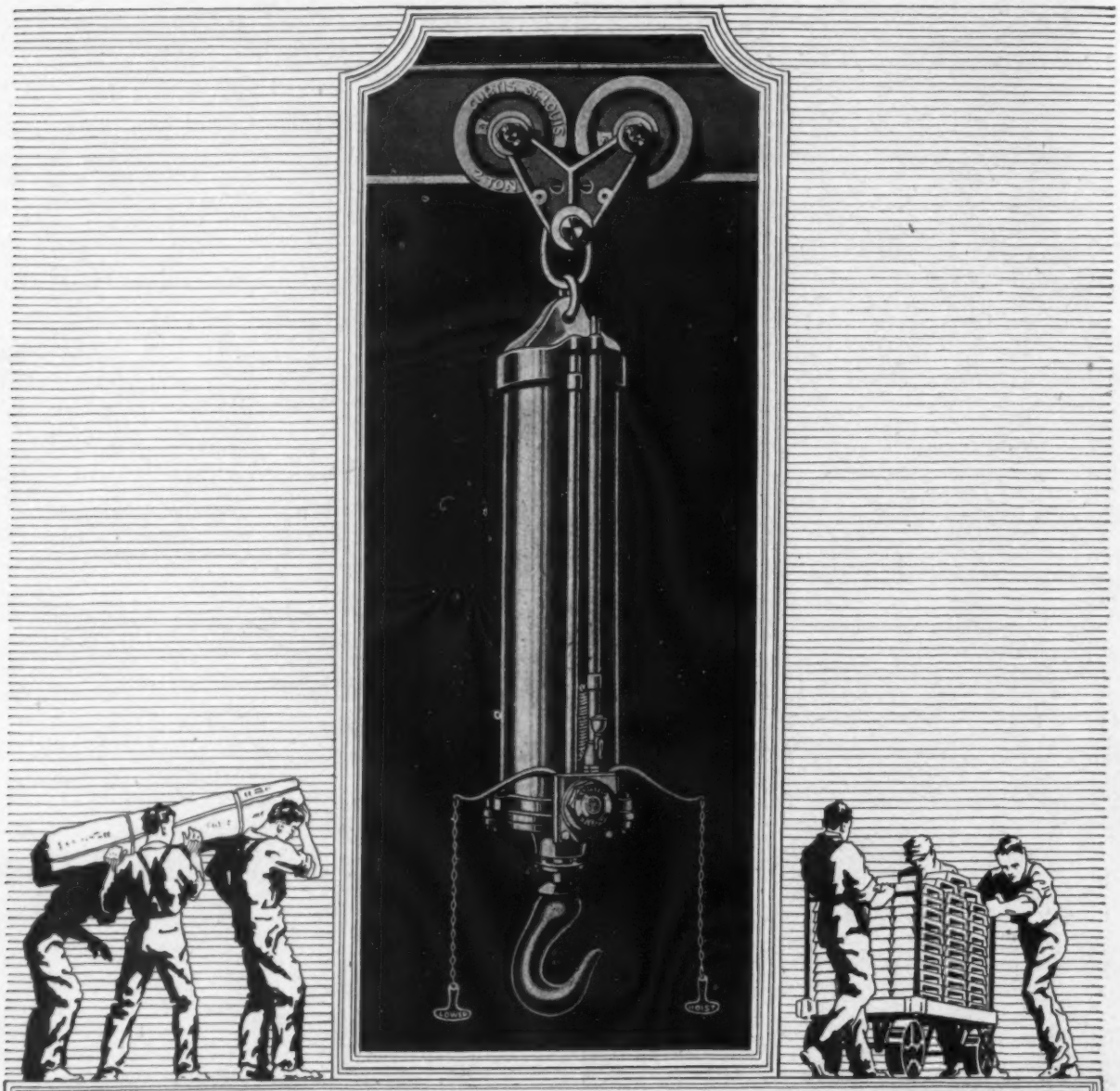
Now, why have these modern inventions been developed while a science which originated years before Christ has stood stagnant. Some will claim that textile machinery has changed and advanced, but we learn from history that the Indians carded their cotton with old hand cards and spun with a revolving spindle and wove with warp ends drawn through harnesses. All this they did by hand, and we have simply applied power to the old principles.

Through our colonial days, the hand cards and hand spinning wheels and hand looms were used and it was not until Eli Whitney invented the cotton gin in 1792, that much progress was made toward our present-day machinery. With the use of the cotton gin, improvements in manufacturing were necessary and changes came in rapid succession. It was during these developing years that the present-day cotton machinery was built. Since that time there has been but one radical change, and that was the ring frame which took the place of the mule.

It may be well to consider each process in manufacturing, that we may be able to observe any changes that have been made, as the object of this article is not to underrate the value of the progress which has been made, rather, it is to put some "pep" into this progress and develop textile manufacturing more rapidly.

Pickers were invented in 1797, and the only change made in them has been in the variety of beaters, which can be used.

Cards were first invented in 1769, and they show a more marked change than do pickers. When the revolving flat top was patented, it practically displaced the old stationary flat top. I wish to point out that this was not a change



CURTIS AIR HOISTS and TROLLEYS
SAVE MAN-POWER

CURTIS Trolleys are constructed with self-equalizing steel side frames and large inclined wheels fitted with shock-absorbing Hyatt Flexible Roller Bearings—making them easy to start—easy rolling and long lasting.

CURTIS All-Steel Air Hoists, in design and construction, present the perfected results of 25 years of manufacture. They are simple, safe and economical for light and medium loads. Capacities, 800 to 20,000 lbs.

CURTIS PNEUMATIC MACHINERY COMPANY

1646 Kienlen Avenue ST. LOUIS, U. S. A.

Branch Office: 532-R Hudson Terminal, New York City

in principle in carding, but simply a means of facilitating the object.

Drawing frames were invented in 1775, and their construction is the same today as then.

The fly frame was invented in 1769, after having gone through a process of experimentation which produced a machine, incapable of being improved as it stands.

The ring frame was invented in 1828, and was such a great improvement over the mule that the latter has almost passed into disuse.

Spooling, warping, and slashing machines do not need our consideration now.

The first power loom was invented in 1678 and additions have been numerous. Each of these afford an opportunity for serious study. The automatic loom, invented in 1894 by Henry Northrop, is an example of what can be accomplished with textile machinery.

Joseph Jacquard invented a machine so nearly perfect in the object he sought, that could he step from his statue in Lyons, France, he could see thousands of machines in use identical with his original.

The above facts and dates were compiled by the writer from histories of textile manufacturing and encyclopedias, and to the best of his knowledge are authentic. The inventions enumerated are simply great lights which shine in every textile history and the writer's object is not to hold these up and say, "This is the progress textile machinery has made."

Thomas Edison apparently believes it is possible to make a machine which will talk with the dead, so is it impossible for us to believe that some day a machine will be built which will manufacture from raw cotton a finished yarn or possibly a finished cloth?

A few men have developed inventions as a pastime, but the great majority have done it for financial gain, although often when they have done the work, they are invariably willing to have their invention used, even though they receive nothing in return. This fact is definitely proven by the cases of Henry Northrop and Joseph Jacquard. Northrop died in poorer circumstances than he should have. Jacquard died broken-hearted because his machine was ridiculed, and then, after his death a conscience-stricken people erected a monument in his memory.

There are today hundreds and perhaps thousands of men working on inventions, trying to facilitate cotton manufacturing, and 99 per cent of them are being held back by adverse and narrow-minded opinions, when they should be receiving help and encouragement. The reason for this is probably the fact that anything new or radical is condemned forthwith, and must prove its value, if it has any, by a slow process of demonstration. The manufacturer is not interested in a new machine until the machinery builders have experimented and corrected all the slight flaws and the machinery builder is not interested unless he can see immediately that after his experiments, the new machine will sell and reward him for his work. The result of this condition is that inventors are always chasing rainbows and their ideas are bumped around until some kind-hearted gentleman pats the inventor on the shoulder and tells him what a lot of experience he has gotten and then buries the idea in a pigeon-hole grave.

All of these thousands of little insignificant ideas amount to nothing now, sprinkled throughout every mill office in the country as they are, but if they could be combined and be considered by broad-minded men from both mill and machine shop, men who would look toward promoting the textile industry as a whole and not toward personal gain, these dormant ideas would develop and apparently mysterious changes would take place. This fact is proven by two great examples. The first is the German ambition before the great war. The German people had developed processes which other people were then ignorant of, through concerted action; by every competent person pushing an action through to a finish for the good of their country. It is even believed that most of the so-called German ideas originated somewhere outside of Germany and were simply developed there. When the war clouds gathered, we saw our ignorance of some of the valuable secrets Germany possessed would prove fatal to us, so we promptly set about to discover those secrets, and in less than two years after we were cut off, we were producing substitutes as good, and in many cases better, than the original we had previously imported. How did we learn to make these products, by individual action? No. It was by the combined efforts of specialists in the subject at hand.

A similar example is the rapidity with which munitions and articles of war were invented and produced in this country to defeat our enemies. By the combined efforts of our naval officers, devices were discovered which proved a menace to the submarines, and in a like manner the war department was able to discover land devices which no other nation could combat successfully. No doubt these ideas, which were successfully worked out, originated in one mind but their development into useful articles was speeded up by the suggestions and experiments of experts working collectively for a common end.

Let us now return to the subject as it most vitally interests us men of the textile world. If an inventor of a textile device could go before a committee composed of experts in both machine building and cotton manufacturing which would help in the development of his idea, the textile industry would be benefited by the service and marked changes would result. This committee might have the power to combine different inventions along the same line so that the perfect points of one idea could offset the imperfect points of some other idea. Haven't you mill men ever stood beside two like machines of different make and thought what a great machine you'd have if you could only combine the two? But the patent on one is in one machine shop and the other patent is miles away in another, and the two machine builders watch each other to see that no infringements are attempted.

The cotton industry is of sufficient magnitude to give financial backing to such a committee in order that each inventor could be properly reimbursed for his idea. Perfected ideas produced by this committee could be sold to the highest bidder among the machine shops, and in this manner become self-supporting.

This is a subject which, I think, should be seriously considered at our textile conventions and the old idea that our industry is good enough and that we can get plenty of labor from Europe to run our mills as they are, should be abandoned.

Why not endeavor to reach the highest pinnacle of perfection?

M. W. H. (Mass.)

Employers Liability

Insurance At Cost

The MILLERS INDEMNITY UNDERWRITERS saved Southern Textile Mills twenty-seven per cent. of their liability insurance premiums for the years 1918 and 1919.

We specialize in class insurance, which is the real answer to INSURANCE AT COST.

Our service is of a personal nature, and through our Atlanta Office we are specially equipped to care for the needs of the Georgia Mills.

MILLERS INDEMNITY UNDERWRITERS

BAILEY & COLLINS, Managers

201-202 Walton Building

ATLANTA, GEORGIA

Greenville **Dallas** **New Orleans**

A Shop Conference on Supplies.

EDITOR COTTON:

When the meeting opened the manager said, "Before we take up the questions in the box, I wish to give a few instances of why we need cooperation between you foremen in the plant and the men in the office."

"Yesterday was supply day, and Robert came to me and said that he could not fill the requirements for brooms that had come from the various rooms. After looking the matter up I found that we had received up to date twelve dozen more brooms than last year, and had less old handles returned. What made the matter queerer in my mind, we had used for trial another method of floor cleaning for four months. So I told Robert, 'You will have to look over the supply cupboards and see who is so grasping.' In about an hour he came back with a smile, saying, 'The carding room has enough to keep them in brooms for two months, and yet they put in an order for two dozen more.' When William came into the office, in response to my summons, I asked, 'Why do you need brooms today?' He twisted about a little, and replied, 'We had a time the first of the year when we could not get any, and so I made sure to have enough on hand always.'"

"Again, last week the machine shop reported that some looms were stopped for wooden repairs, and Henry said the books showed that there should be more than two hundred of these in stock.

"He took the weaving room on the run, hauled the stock out of the closets under the section hands benches, and discovered that Tom had all but ten of these hidden under some loom aprons. 'What do you mean to do with all these parts?' he inquired. Tom said, 'Every time I go down to the shop, I bring up a few, as I never mean to have a loom stopped.'

"Now, men what is the answer? Supplies run into money, and when they are needed, they are to be used all over the plant, therefore, why should some of you feel that your share of the stock should be so large?"

William rose to his feet, turned around a little, as some of the others laughed, and said: "I am willing to take my share of the blame, and admit that my plan was wrong. What we ought to have is a graphic chart on belting, brushes, brooms, oil cups and all supplies that each room uses. Then each one can see what the other rooms have used each six months, and can cut down the stock that they keep for spare."

This suggestion was thoroughly talked over by one and another, and the following conclusions reached.

1. Supplies should be posted on a sheet—if possible—each week, giving the number of each piece each room uses. This sheet should also show the previous week, and the last yearly amount entered.

2. The cost of supplies in total for each room should be averaged for two years, or five, if convenient, and this amount used as a weekly standard. If the amount used is more, it should be entered in red, and the overseer should send a report, why, and where used, to the office with his next payroll sheets.

3. If there is a change either lower or higher in the general cost of supplies, these should be taken up at the next shop conference, after such change, and the new standard agreed upon for the weekly report.

4. At the first meeting after the close of each month, these results should be put on a chart, and each room foreman have the chance to comment on the results shown for their room.

5. At the end of a six months' period, a bonus should be given to the room or rooms that have averaged more than five weeks, below the weekly standard posted on the sheet.

After this discussion, and the adoption of the rules outlined to be followed, an informal talk on supplies among the members brought out several interesting facts.

It seemed that several of the men did not know the way to test the excellence of the supplies used. One said, "I have always taken the narrowest belt that would run the machine, but, now, after what we have decided, I shall use wider belts on the cards, drawing and fly frames, as wide as the shipper will take." Then he added, "I have sent back all but twelve brooms, and am going to devote tomorrow and find out for myself why the sweepers use them up so quickly."

One of the purchasing department clerks was selected to bring samples of various supplies, left by the salesmen, and get the ideas of the meeting, as to why one was better than another. Each department head agreed to bring a new plan for the saving of some of the articles used in the next month to be discussed in open meeting. The subject of belting was selected for the next meeting, and all were to get any information possible on it.

A. H. G. (Conn.)

Plant Government.

EDITOR COTTON:

In every mill there must be some system of government. There must be some rules and regulations whereby the orders can be given out, received, understood and carried out by the overseers. Of necessity these rules should be consistent, be simple so that they can be easily understood and prudently enforced. The integrity and unanimity of any plant depends entirely upon a good system of government. Where system is lacking there is bound to be a great deal of confusion and possibly chaos.

Among a few mills there is no good system of government and the conditions all the way through the plant are deplorable. This condition of things varies a good deal among the different mills thus afflicted, but the results are always inevitably the same: dissatisfaction among the help, poor quality of goods, shortage of production, excessive wastes, neglected machinery, costly repair bills and poor regard for the use of supplies.

And this state of things is not always confined to the smaller mills, but even very large mills have been so afflicted as to be wrecked upon the same rocks of government.

The trouble in one mill may be where everybody is boss. In another it may be where nobody is boss. In still another mill there may be only one boss who is so overloaded that he cannot possibly carry the burden properly. The mill which is over-bossed cannot fare much better than the mill which is underbossed, or has no boss at all. There is still another type of mill where there are bosses enough. They have their work laid out and boundary lines described, but they are not pulling together. In other words, they are not organized and delivering the good service for which they are paid.

TAPE for spinning and twisting frames is a staple, and there's not much to say about it, but you can depend on it that

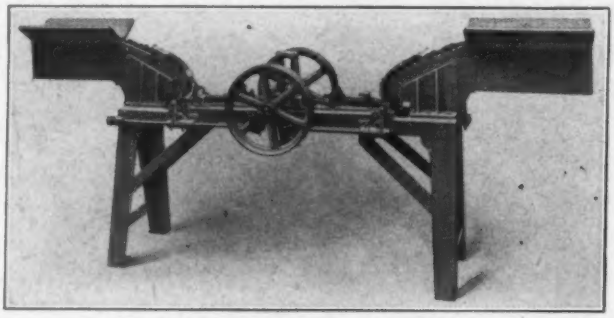
K-G SPINNING TAPE

is as good as can be bought—an honest product, the finest woven, the smoothest edges. The quality and stamina is there, and you have only to use it to be convinced of its superiority. Sample upon request.

Knit Goods Specialty Co., Chicopee Falls, Mass.

THE TAPE MAN SAYS

"Reputation is what people say about you—character is what you are. K. G. Tapes don't depend on their good reputation, but they back it up with honest-to-goodness character quality."



When You Install an

"UTSMAN" QUILL CLEANING MACHINE

You have the satisfaction of knowing that you installed a machine that is guaranteed to

CLEAN 80,000 AUTOMATIC LOOM BOBBINS PER DAY

With a cleaning efficiency of 98 per cent. The main features of the "UTSMAN" Quill Cleaning Machine are its

DESIGN, CONSTRUCTION, SERVICE

Write for Catalog. It will show you how to cut your Quill Cleaning Cost.

THE TERRELL MACHINE COMPANY, Inc.

Charlotte, North Carolina

In all mills there must be a head and tail. It cannot be all head nor all tail. It must be a graduated organization, and be so arranged that everybody knows exactly who's who and what's what. It must be a homogeneous organization and so the system which works out the best is the one which holds the organization up as one body. There must be unanimity. The entire body must think alike and the same as the one man who is altogether and immensely interested in the success of the whole proposition.

And there must be such a man at the head of every mill. No mill can prosper without him. Either the owner or his agent must start the system going right and then be on the job to see that it continues to go right and stop right. It is easy enough to get followers, but there must be leaders and leadership. Leadership is the basis of all organizations that succeed. To better illustrate the need of this organization, I will point out what really happened in a certain mill some years ago.

In a mill of considerable size and doing a great amount of business, there were the following men in full charge of the plant, and having the entire freedom of the plant and the privilege to boss things considerably as they liked part of the time. First, there was the general manager. He, of course, was quite head boss and could and did do more as he liked than the rest of the executives. He could go and come when he pleased and break in with an order anywhere. Next to him was the man whom he called his "manager." He had charge of the office and about everything else and roamed through the mill a few times a day seeking whom he might devour. At times he would even appear and act much more important than the general manager of the plant, especially if the G. M. were not around. The general manager had still another man to represent him whom he called his "agent." This man was an expert manufacturer and was supposed to have charge of the manufacturing whenever the general manager was not doing the manufacturing himself, or when the "manager" was not interfering between times. His manufacturing capacity all depended upon how much work he could sandwich through before the manager came in on one side and the general manager on the other side.

Next to these three men there was also provided a general superintendent who ran wild to see how far apart he could keep himself from the other fellows. For he was the buffer for the other three men, and so his hardest job was to keep as far aloof from all of them as he possibly could. He had several hiding places throughout the plant and some manholes to drop himself into, when necessary, in order to avoid the other fellows in their turn as they rushed past him with their hands full of orders to be given to the help direct. There were plenty of overseers drawing good pay, but they were not needed as the help got their orders directly from the general manager. The "manager," "agent" and "general superintendent" were merely there to see that the general manager's orders were fully carried out. They also went directly to the help because the overseers had lost entire control of all the help and they would not interfere with their superiors in office. The only time the overseers kicked was when they were given anything to do, for their chief business was to sit down and look on.

The general manager of the mill was a much over-worked man and he wondered why he did not get results. None of his assistants knew what their duties consisted of, or where the other fellow's work began or left off. His assistants were not finding any fault with his methods. Some of them knew that there was a much better system of management, but it might have cost them their jobs to have suggested to him any new things. They were not anxious to lose their jobs as they were well paid and might never get such easy jobs again anywhere else.

How did this kind of government effect the help? They paid no attention to anybody but the general manager. Whenever they wanted to stay out, or get a pass or make a complaint of any kind, they always went straight to the office to see the general manager. He was never too busy to listen to their tales. He never referred their troubles to any of his assistants. He wanted to do everything himself. In fact he rarely talked with any of his assistants nor paid them any attention.

On account of all this the mills were in a state of chaos. The general manager actually had notices posted in his mills to the effect that they were to close down for a few days. And his assistants did not even know of the proposed shutdown. They got their information from the help who first saw the notices.

Now we will picture these same mills under a unified plan of management. The general manager engages a capable office manager to take care of his office system. This man has nothing to do with the mill. A capable manufacturing superintendent is also engaged to have full charge of the manufacturing and the help. The general manager wants something to do so he will act as his own agent and not go into the mills to interfere with anybody. He will hold his manufacturing head entirely responsible for the goods produced and for the interior discipline of the plant. If an order is given it is put through the proper heads of each department. The overseers supervise and have authority and full control of their help. These overseers have the respect and confidence of the help and of their superiors in office. There are no dead heads nor walking nonentities. The owner, who acts as agent, is the general business head. He respects his head manufacturer and takes him into his confidence. An order which goes through is given simultaneously to whom it may concern in the plant. Everybody in the mill has but one mind and that is the success of the plant. All think alike on this one subject, and all hands are strongly devoted to its fullest accomplishment and they all succeed.

Supt. (R. I.)

Lockwood, Greene & Company, 60 Federal Street, Boston, Mass., have appointed Dr. Albert Hale as their resident representative in South America. This arrangement was made because of a steadily growing business there and the prospect of added future demands for an intimate knowledge of South American conditions. Dr. Hale is very well known in South America, and has an intimate knowledge of the affairs of the country. He has been commercial attache at the American Embassy at Buenos Aires and elsewhere, and has had experience in Chile as intelligence officer with the United States Navy, and has been identified with business houses whose interests were centered in Central and South America. His tentative address is care the American Embassy, Santiago, Chile.

FAFNIR

DOUBLE BALL BEARING HANGER BOXES

A year or so ago the Bryant Chucking Grinder Co. was confronted with what at first seemed to be the necessity of buying a bigger motor to run part of their shafting.

The difficulty was experienced in starting, when the peak load would invariably trip the circuit breaker several times before the overloaded 40 H.P. motor could start the 2 lines of shafting and 42 big machine tools which it drives. Moreover, the power was often shut-off before the belts could be shifted to the loose pulleys, and then it was necessary to help start the motor by pulling on the belt by hand. Something had to be done right away.

Then they equipped the 2 lines of shafting with *Fafnir Double Ball Bearing Hanger Boxes* which were installed right in the original hanger frames. In this way they eliminated friction so thoroughly that they can now start the motor easily with power to spare.

Fafnir Double Ball Bearing Hanger Boxes will pay for themselves in a very short time as the result of vastly more efficient power transmission. Install them now in your present hanger frames, pillow blocks or post hangers.

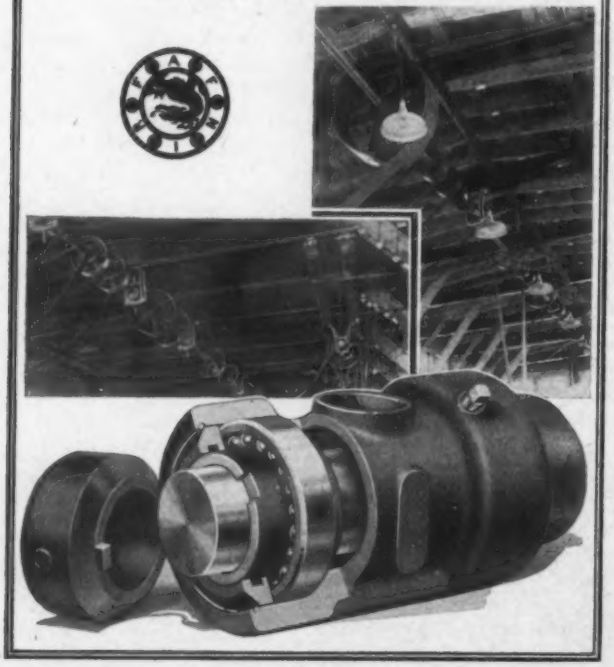
Ball Bearings for Every Purpose.

THE FAFNIR BEARING CO.

Conrad Patent Licensee

New Britain, Conn.

DETROIT Office: 752 David Whitney Bldg.
CHICAGO Office: 1301 Michigan Ave.
CLEVELAND Office: 916-917 Swetland Bldg.
NEW YORK Office: 5 Columbus Circle.



STAINED GOODS?

Not if you use

SLO-FLO

The Scientific Lubricant for Textile Machinery

MILLS that have become so accustomed to losing thousands of dollars a year through stained goods that they consider this loss a part of their fixed overhead are astonished when we *prove* to them by actual demonstration that they can entirely eliminate the "stained goods" item.

The lubricating medium which makes this great saving possible is SLO-FLO, a super-quality, semi-fluid oil that adheres to the bearing surfaces regardless of high speeds. SLO-FLO positively does not throw, spatter, run, crawl or drip, and can be used to advantage on all types of textile machinery.

One of our lubrication engineers will give a demonstration without obligation to you

Made by the ACALORIC Process

SWAN AND FINCH COMPANY
NEW YORK

Quality Lubricants Since 1853

Atlanta, Boston, Buffalo, Charlotte, N. C., Chicago, Cleveland, Detroit, New Orleans, Philadelphia, Pittsburgh, San Francisco, Syracuse

CATARACT REFINING COMPANY, Limited
Toronto, Canada London, England

SCIENTIFIC LUBRICANTS for SCIENTIFIC LUBRICATION

Practical Carding Advice.

EDITOR COTTON:

After reading what Contributor No. 14, and others, have to say in your paper, I can say it is at least interesting to note the different ideas.

By way of introduction I would say that I worked in the Saco-Lowell Shops for three years and have spent the past 17 years in the carding department as picker man, stripper, grinder, fixer, second hand and overseer and have worked on all kinds of yarn, knitting yarns, tire yarns and weaving yarns. I therefore believe I am in a position to fairly judge.

The great trouble with many mills today is that they rush the carding in order to keep the rest of the mill running, and do not consider that carding is the first and most important of all operations as there is where the work is made or spoiled.

The draft and speed differs according to the quantity the carder must turn out in every job he takes.

The first requisite of a good carder is a cool, clear brain and a whole lot of energy and common sense. The first class carder finds out first the amount the spinning room can do and then works accordingly. The carder must have a practical knowledge of cotton and the cotton fiber or staple to enable him to know what he can do and what he can expect.

The first process—picking—should be given a great deal of attention. The beaters should be run as slow as possible and the cotton should be given just enough beats to remove the large dirt and not break or injure the fiber in any way. The settings of grid bars and feed rolls should be carefully considered, especially the latter which should be set according to the staple being run.

The next process—carding—is a very important one, and here again the settings must be carefully looked to and the grinding kept up and the licker-in kept in good shape.

Then comes the drawing, which I have found to be sadly neglected. Here the rolls must be set as close as possible to the length of staple used and each succeeding roll should draw the fibers easily and evenly and the tension between the front rolls and calender must be just enough to take up the slack.

If these processes are looked after as they should be the rest all through the mill comes easy.

The slubbers, intermediates and fine speeders should be figured out very carefully as to drafts so that they will have a relative draft of 4, 5, and 6, or as near that as possible. It isn't practicable to make a different hank slubber or intermediate roving for each hank on the fine, nor is it possible to maintain these drafts and supply each succeeding operation or the spinning, so the overseer must consider very carefully and use the best he can under the circumstances.

The slubbers, intermediates and speeders should be started up as slack as possible only having enough tension to keep the ends up and not tight enough to stretch the roving and enough layers or rows so that the bobbins can just be seen. Then the right tension gear may be selected and the frame will run almost perfect.

There are a great many things that only experience can teach and all practical overseers will agree that what can be done one way in one plant must often be done in an entirely different way in another plant to accomplish the same results.

I would like to say this one word to the new overseer: Never make a change until you have weighed and thought out all the good points, and all the poor ones, and be sure you can improve the quality, then go ahead. Never condemn your predecessor until you have proven you are a better man; then let the other fellow do the talking. Be firm, even severe, yet square, and your help will respect and honor you.

W. M. (Conn.)

Further Details in a Mill Experience.

EDITOR COTTON:

We are very much interested in "A Mill Experience," Contest Letter 54, signed by "Wash (Conn.)," in the November number of COTTON. If it is not too much trouble, we would very much appreciate it if you would submit the following questions to the writer of that letter and present his answers in the Practical Discussion Department of an early issue.

1 Length or staple of cotton?

2. Number of beats per inch that "Wash" was beating the cotton in the picking room?

3. How many processes of drawings and number of doublings on each drawing?

4. Size of flyer on which he was running 6.00 H. R.?

5. Revolutions per minute of spindles?

6. Revolutions of front roll?

D. F. (Conn.)

EDITOR COTTON:

Replying to the questions submitted by "D. F. (Conn.)," in the experience which I related in the letter in the November number I was using 1 1/16 inch cotton, beating it 44 blows to the inch. I ran two processes of drawing with six doublings on each drawing. The flyer on which I was running the 6.00 H. R. was a 7 x 3½ inch flyer. The revolutions per minute of the spindles was 1,300 and the r. p. m. of the front roll was 124. The fly frames were made by the Woonsocket Machine and Press Co. As I keep all production reports on file, the following is the exact number of hanks turned off. I think we were running 58 hours at that time. $192 \div 6 = 32$, constant for production. $1{,}316 \times 32 = 42{,}112$ pounds turned off.

Wash (Conn.)

The annual meeting of the Associated Manufacturers of Water Purifying Equipment will be held Wednesday, February 2, at Chicago, Ill. This association, a comparatively new organization, was, as its name implies, formed by representatives of firms manufacturing the various forms of water rectification equipment. Its purpose is to work out problems of mutual interest which will enable its members to give better service to and establish better relations with the trade.

Among the problems under consideration is the standardization of certain equipment. At the coming meeting a report will be made covering suggestions for standard connections for the filter sizes already adopted and suggestions on a standard for cast iron filters. The program of the meeting will include papers on filtration, water softening and sterilization. The association has already taken up the matter of standardization of contract forms.

BLEACHERS!

You are hearing of the "Better Bleach". That means that the trade wants a better bleach (without increase in cost.)

They want no more goods that turn yellow; that have lost a good part of their strength; that are harsh and hard instead of soft and elastic.

You know that you can satisfy this demand only with the peroxide bleach, which we will teach you.

Get busy:

THE ROESSLER & HASSLACHER CHEMICAL CO.
41st Street & Sixth Ave.
NEW YORK

A Wartime Experience.

EDITOR COTTON:

During the war period, as we all know, the mills were struck very hard by the conscription of men into the army and the enlistment of others in the navy. This meant filling in with women and girls, also a great many green help who had to be broken in.

I was one of those who had to remodel their departments and change from male to female help, as the men were being called into the service by the dozens. It was a good sized task, as some of the women had never worked in a twisting department and, believe me, they were hard to teach and as it was an $18.00 job they were out for more pay and would only do just so much work each day.

The women had the idea that because they had joined the different labor organizations they could do just as they saw fit, and owing to the shortage of help, they took things pretty much into their own hands.

Production started to drop and as we were on government orders something had to be done. There were seven sections in my room and I divided the doffing as follows: three frames to each man doffer—a section of fifteen frames for five men; three frames to each woman doffer—a section of fifteen frames for six women, and as they were green on the job I added an extra doffer to each section.

The frames would run seven hours to a doff, and every time a frame was doffed, the rollers and rails had to be washed with gasoline or some other liquid. The women did not like the smell of the washing liquids so I allowed them to use water for this purpose. This brought some relief but they were still dissatisfied.

One day while I was walking down an alley I saw one of the women doffers making lace. After going around her frames and finding that they were all going I said nothing to her, thinking that if she had any common sense a hint would be enough.

The next day I passed by her frames again and there she was, making lace. I told her she was not allowed to do that during working hours and that I did not wish to see her or any other one doing it again; she put it away and I started around the room.

A few days later I was told that this woman was getting the other doffers together and that they were going to report the matter to their labor orianization at its next meeting.

Before the day of the meeting, I called all the doffers together and told them that they were expected to look after their doffing and not make lace during working hours, and that if they insisted on making lace, I would get a new set of doffers. I explained to them that the men in whose place they were situated had given up their jobs—some of them their lives—for them and all the others who were not in the service, and that the proper thing for them to do was to put forth every effort to speed up production and make good work. Practically all the work we were making at that time, I pointed out, was for the government, and a defective gas mask probably meant a dead soldier, maybe a brother or a close friend of one of the doffers; a poor piece of cloth, if sent through, meant a leaky tent, and I asked the doffers how many of them would like to sleep in a house with a leaky roof?

The reader can wager his last penny that this turned the trick. They told me then and there that they were

sorry for the planning they had done and said that they had changed their minds about reporting to the labor organization, and that all were satisfied.

The incident caused ill feeling between the girl who had made lace and the rest of the doffers. I knew it and had a talk with them all and after that they were a little more friendly toward her. But the poor girl could never get over it, and felt out of place and one day she told me that she was "getting through" the next week end. I told her there was no reason for that and she said that she could not face the other girls after what she had started. I told her that I would get her a place in some other department if she would take it. She did and is still there, at this writing, satisfied and surrounded by a group of friends.

The foregoing is a letter which I wrote during the war, but which was lost and just came to hand. It goes to show what a few good strong words, at the right time and in the right place, can do sometimes. It is an example in human nature, and psychology is something all foremen should master.

Did I get better results? You bet I did! The following figures speak for themselves: 393,000 pounds of yarn per week, on 23/1s yarn. Furthermore, I never had any more trouble with the girl doffers, but in closing I wish to say, give me men and boys instead of girls.

T. A. B. (Mass.)

The Largest Plant of Its Kind in America.

Over in Johnson City, in upper East Tennessee, right in the heart of the famous southern hardwood section, is located the plant of the Southern Bending Company. This concern enjoys the distinction of having the largest plant in the country devoted to the manufacture of hickory loom parts.

Being so situated, the company has a plentiful supply of hickory from which to draw. They own their own boundaries of timber, do their own sawing, and carry their own stock. Thus it is that they are enabled to be very exacting in the selection of the hickory intended for their loom supplies.

The hickory they use is only of the best quality, and it is *properly* seasoned. This means much to the textile mills. It means that while a good deal of the moisture content of the wood has been eliminated, the life of the hickory has not been destroyed. This is really a very important consideration in the manufacture of good loom supplies.

This company's plant is well equipped. Every up-to-date machine needed for this work is installed. Experienced men handle these machines, and the facilities at hand are capable of turning out two or three thousand picker sticks, or other parts, a day, when necessary.

The officials of the company adopted a policy, long ago, which viewed from the standpoint of the textile operators, is certainly all that can be expected. They say that only the very finest loom parts shall leave their plant; that these supplies must be made with such care and exactness that the men who use them will learn to have complete confidence as to their worth; that every courtesy and consideration must be given to every customer, and that, in the event any piece shall prove defective, a new part to take its place, shall be sent out immediately, without cost to the customer. And this policy is rigidly followed. They also claim for this company the ability to furnish an absolutely dependable source of supply for all kinds of hickory loom parts of unquestionable merit.

Another Mill Experience.

EDITOR COTTON:

In reading the letter by "Wash (Conn.)" on "A Mill Experience," in the November issue, there was brought to my mind an experience which occurred when I accepted the position of carder in a certain mill that was running on numbers about the same as those mentioned by "Wash."

The spinning was not running well, and the carding was not going as it should, so I at once began investigating the different weights and drafts and getting a line-up on the carding of the different machines. First I found that I could satisfactorily make a lighter lap than the one being made, because they had too many surplus laps ahead on the carding machines. To do this I lightened on the breakers first, and then on the finishers; I omitted the intermediates as I discarded them for better breaking strength on the yarn, or that was my intention, and in the course of time we found that we did get a better strength on the yarn.

I lightened the finisher laps from 11-ounce laps to 10-ounce laps, using the same feed gears on the cards, which produced a lighter sliver, then on the drawing frames I equalized the drafts, at the same time leaving the slivers slightly lighter than they were before the cut in laps. On the intermediate roving frames I did some regulating of the drafts and let the fine (jack) frames run some lighter in order that the spinning could get a shorter draft as the drafts were then too long.

In this way the spinners were allowed to shorten their drafts two teeth in the gears, which made quite a difference in the running of the spinning. I also had the cards well set over, the screens all taken out and cleaned and regauged and a little extra grinding done, and then I instituted regular cleanings at specified intervals on all the carding machinery. I went over the tension gears and saw that they were of the right size to carry the cone belt out on its journey as the frames filled up.

At the time, the carding was keeping from one to two days' run ahead of the spinning and would stop off at times and unload this surplus roving onto the spinning, usually when the spinners could least afford it, as it often caught them when the work was running badly, and of course this made it go still worse; usually the rats had bedded in it and cut it up more or less. Also, lying packed up this way very long at a time would cause the roving to get pressed, almost to four squares to the bobbins.

The first thing I did after getting the room as near to my liking as I could was to let the spinning catch up on this old roving and to take a new start together with the card room. After a short time the spinners were getting off more production than ever before and the work ran better. The card room hardly ever got enough ahead to stop off longer than a half day on Saturday morning, more than once in six months. In this way we all got off more production and everything ran so much better after we got the production drafted down so that each machine just would keep out of the way of the preceding one.

Of course all carders desire to run ahead of the spin-

Mr. Mill Man

The average life of your Card and Comber Brushes is Ten Years.

The Cost of Keeping them in Proper Condition is about fifty cents per Year.

Now is the Time

while your mill is operating on a short schedule to

Have These Repaired

We make a specialty of repairing brushes of every description and are in a position to render you prompt and efficient service.

Distributors for

Garvey Stencil and Marking Ink

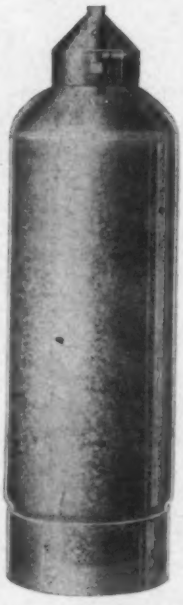
A non-evaporating waterproof Marking Ink which is impossible to rub off. COMES READY FOR USE.

We Manufacture Every Description of Brush used in Textile Mills —Your Catalog is Waiting.

Atlanta Brush Company

Successors to D. D. Felton Brush Co.

Central and Trinity Aves. ATLANTA, Georgia



COTTON MILLS SHOULD USE Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 30 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. East Deerfield, Mass. Boston, Mass. Toronto, Ont. Moberly, Mo. Bound Brook, N. J. San Francisco, Cal. Berkley, Cal.

C. M. Wall & Son

Southmont, N. C.

Manufacturers of North Carolina BOX SHOOKS, BOX LUMBER and CRATING MATERIAL.

We Make a Specialty of the Textile Business.

ning and stop off occasionally on Saturday morning which is all right, but even drafts on each machine—to keep it out of the way of the one before it—not only keeps fresh stock going through all the time, but also makes it run so much better. In this way a closer tab can be kept on the numbers being run, and it will be easier to draw a finer line on just the fractional point of hank which will make so and so when it is spun out. This is one very important point—to keep close numbers; giving cotton away on numbers does not set very well with the mill owners, and it's an easy matter to keep the numbers right if you will only watch.

To get back to the story, the thing that prompted me to write this letter was the number of doffers "Wash" had around the roving frames. It seems that he had a few too many. When I took the job to which I have referred in this letter, I found the previous carder had seven doffers to the job, which had 34-7 x 3½ jack speeders making 5.50 and 6.50 H. R. for 30s warp and 40s filling. After we got going good and strong I cut out two of these doffers, as with the seven on the job they always seemed to be in one another's way, and I got along as well if not better with five than I did with seven, and the production was just as good. But we had the section man to keep them hustling in a pinch. This, you know, keeps things lively—when you have to keep hustling, for when you do not have to hustle, things will be on the drag; that goes without contradiction. Contributor No. 14.

Clark's Weave Room Calculations.

This is a practical treatise of cotton yarn and cloth calculations for the weave room, prepared by W. A. Graham Clark, textile expert of the United States Tariff Commission. It is illustrated by graph and contains 168 pages of reading matter. This book is intended primarily for use in the mill, as an aid to those who have to make calculations dealing with cotton cloth. The first part of the book contains concise rules for making cloth calculations, grouped to facilitate use. An original feature of the book is that section dealing with the ascertainment of the contraction in length of warp and filling yarns in the weaving of plain fabrics.

A section of the book lists more than 1,000 typical American cloths and shows full particulars including the counts of yarn used in each case. A short chapter shows the systems used in numbering yarns of different materials, and brings out salient facts as to materials of interest to the cotton weaver.

This book is published by the Clark Publishing Co., Charlotte, N. C.; the price per copy is $2.00. Copies may be secured through COTTON.

The Youngstown Sheet and Tube Company, Youngstown, Ohio, is sending out a 1921 calendar containing twelve two-color illustrations showing interesting processes in the manufacture of iron and steel. They advise that they will be glad to furnish anyone with one of these calendars upon receipt of six cents in postage to cover cost of wrapping and mailing.

D. C. Dunn has purchased Leathers patents No. 869,856 and No. 1,048,324 for bobbin stripping machines.

Notes About Men You Know.

D. Y. COOPER, president of the Harriet Cotton Mills and Henderson Cotton Mills, Henderson, N. C., and one of the most prominent manufacturers and exporters of cotton goods in the country, died suddenly on Monday, December 20, following an illness of three days. He was in his 73rd year, and his death was due to angina pectoris or congestion of the heart. Mr. Cooper was known to the entire textile industry through his active participation in the country-wide movements for the betterment of the trade. He was a former president and active director of the American Cotton Manufacturers' Association, and during the war served as chairman of the price fixing committee on textile products, appointed by President Wilson. He was, in addition to his textile activities, one of the founders of the Citizens' Bank and Trust Co., Henderson, N. C., and was also actively identified with the tobacco industry. He is survived by his widow, four sons and one daughter.

F. L. BRANSON, formerly general superintendent of the southern division of the Consolidated Textile Corporation, has assumed the duties of general manager of the mills of B. B. & R. Knight, Inc., which were recently acquired by the Consolidated Textile Corporation. He succeeds Nelson A. Batchelder in this position.

WILLIS E. JOHNSON has been made manager of the southern division of the Consolidated Textile Corporation, with headquarters at Greensboro, N. C., succeeding Mr. Branson. Mr. Johnson was formerly agent of the Tallassee Mills, Tallassee, Ala.

STONEY DRAKE, president of the Drake Corporation, will develop the sizing service department for the Consolidated Textile Corporation in its recently acquired northern mills.

J. E. HARRIS has succeeded Willis E. Johnson as agent of the Tallassee Mills, Tallassee, Ala. Mr. Harris was formerly superintendent of the mills.

P. J. MCNAMARA, formerly general manager of the Lanett (Ala.) Bleachery and Dye Works, and later connected with the Noble Beveridge Co., Cedartown, Ga., died on Thursday afternoon, December 30. The body was interred at West Point, Ga., on Saturday, January 1.

JAMES BRACEY has been placed in the recently created office of assistant secretary and treasurer of the Myrtle Mills, Inc.; Flint Mfg. Co., and Arlington Cotton Mills, Gastonia, N. C. Miss Martha Torrence has been placed in a similar position with the Gray Mfg. Co., the Parkdale Mills, Inc., and the Arrow Mills, Inc., Gastonia.

ANDREW A. MOORE, of the Loray Mills, Gastonia, N. C., died recently at Asheville, N. C., due to a complication of diseases. Mr. Moore had retired from business. He was treasurer of the Loray Mills until his retirement in 1917, and was 59 years of age.

H. J. GODFREY, from Simpsonville, S. C., is now overseer of night spinning at Ware Shoals Manufacturing Co., Ware Shoals, S. C.

LUCIUS J. KNOWLES, president of the Crompton & Knowles Loom Works, died recently in London, England, after a brief illness, from an attack of influenza. Mr. Knowles was born in Worcester, Mass., and was the son of Francis B. Knowles and Hester A. Knowles. He entered the loom business in 1903 with his father and uncle. From 1906 until 1917 he was treasurer of the corporation

The CHICAGO
Approved Portable
WATCHMAN'S CLOCK

Clock with case opened showing Dial in place and Partial Registration.

with its special Waltham movement, its lock stations and its superior quality throughout, is especially desirable for mills and factories and for either in-door or out-door patrol.

Write for Catalogue.

CHICAGO WATCHMAN'S CLOCK WORKS

CHICAGO. 1526 S. Wabash Ave.
NEW YORK. 11 Church St.
ATLANTA 14 Walker St.

CEMENT COATED NAILS

2d.—1 in. x No. 16.
3d.—1¼ in. x No. 15½.
4d.—1½ in. x No. 14.
5d.—1¾ in. x No. 13½.
6d.—1¾ in. x No. 13.
7d.—2¼ in. x No. 12½.
8d.—2½ in. x No. 11½.
9d.—2½ in. x No. 11½.
10d.—2¾ in. x No. 11.
12d.—3¼ in. x No. 10.

SERVICE SUPREME

COUNT AND QUALITY GUARANTEED

Readjusted Prices have been made by us on Cement Coated Nails. Buy from the largest manufacturers.

STEEL & WIRE PRODUCTS CO.

Warehouse and Office
14 WALKER STREET, ATLANTA, GA.
Several Thousand Kegs Kept in Atlanta Stock.
The Lovingood Co., Branch Managers.

GOOD HOMES
MAKE
CONTENTED WORKERS.

Increase Efficiency
Reduce Turnover
Stabilize Labor

AMERICAN CITY ENGINEERING CO.

Civil ENGINEERS Sanitary

Investigations and Reports
Plans, Specifications and Superintendence

Town Planning, Community Development, Industrial Surveys, Industrial Housing, Water Supply, Sewerage, Sewage Disposal, Garbage Disposal, Electric Distribution, Gas Distribution, Hydro-Electric Power.

PITTSBURGH, PENNA.

Peoples' Bank Bldg.

JORDAN MANUFACTURING CO.

BOBBIN MAKERS

Home Office and Plant No. 1
MONTICELLO, GEORGIA.

J. S. HULME

Atlanta Trust Co. Bldg., ATLANTA, GA.

Economy Presses.

Clenzall Dye Machines.

Watson Motors.

Water Softening Systems.

Green Houses.

and became president in 1917. Mr. Knowles also held offices in several banks and was associated with many mills in various parts of the country.

G. M. WHITIN, for more than thirty years treasurer of the Whitin Machine Works, Whitinsville, Mass., died on December 8. He was born in North Uxbridge, Mass., September 11, 1856. On leaving school he served his apprenticeship with the Whitin Machine Works, and became associated with his father in the management of the Paul Whitin Mfg. Co., of which he was later made president. In 1881 he entered the employ of the Whitin Machine Works and was in 1886 elected treasurer of the corporation. This position he filled with marked success until forced to resign because of ill health. During his management of the Whitin Machine Works, Mr. Whitin displayed unusual ability and business sagacity, bringing to his work a great personal energy and a careful attention to detail. Mr. Whitin was also very intimately and widely connected with the textile industry, and during his business career he served on the directorate of a number of mills in various parts of the country.

THE LATE SIR A. HERBERT DIXON.

SIR A. HERBERT DIXON, BART., president of the World Cotton Conference, head of the Fine Cotton Spinners' Association, president of the Federation of Master Cotton Spinners, and president of the Association of International Cotton Spinners and Manufacturers, died in Manchester, England, on December 10. In the death of Sir Herbert Dixon, the textile industry both in America and in England, has lost a man of keen judgment, deep sympathy and broad vision. He headed the British delegation to the World Cotton Conference held at New Orleans in 1919, the conference electing him as its first president. He was born on February 22, 1875, son of Henry Hall Dixon. In 1918 he was created First Baronet W. K.

EDWARD W. THOMAS, former president of the National Association of Cotton Manufacturers and for the last 11 years agent of the Boott Mills, Lowel., Mass., died of heart disease at the age of 68 years.

T. JEFFERSON COOLIDGE, dean of New England business men and noted especially for his achievements in upbuilding the cotton industry in New England, died recently at his home in Boston, in his 90th year.

Machine Guards and Workmen's Compensation.

BY DAVID S. BEYER.*

You all know the story from one of the oldest of Books, about the man who was going to build a house. Perhaps King Pharoah had a pyramid-building project underway at the time and had cornered the stone market; or maybe the mason's union was asking for a half-interest in the house for putting in the foundations; anyhow this fellow decided he could get along all right without a foundation so he just built his house on the sand. You all know what happened when "the rains descended and the flood came," the poor chap might as well have put his money in one of the "50% interest in 45 days" get-rich-quick schemes of the day; he had nothing to show for his trouble but a pile of rubbish after the storm blew over.

Briefly, this story illustrates the experience of many plants in putting in machinery guards, unless they are fortunate enough to have a man on their staff or in consultation with them who has been through the guard-building mills of experience and has learned that in this, as in so many other lines, the best is the cheapest in the long run. In other words, when you are going to guard a machine, it pays to do it right the first time so you won't have to do it over again in a little while. A machine guard has to stand up under a certain amount of handling and natural wear and tear, and in addition it is like the new boy in the country school—it often has quite a bit of natural prejudice and illwill to overcome, and if a covert kick or knock will get rid of it, said kick or knock is likely to be forth-coming before long.

The thin, flimsy, poorly-constructed guards which went into so many plants in the early days of the safety game have now generally been replaced with ones that are built to last as long as the rest of the machine.

Much of the difficulty in getting guards used and keeping them in place will be overcome if reasonable attention is given to the convenience, nay, even to the prejudice, of the man who is going to run the machine on which the guard is located. It should interfere as little as possible with the operation of the machine, and should be so arranged that it can be opened for inspection or repair work, giving access to those parts of the machine that are likely to need periodical attention. It should preferably be so arranged that it is not necessary entirely to remove the guard for any ordinary operation so as to minimize the likelihood of its being mislaid or left out of position. I have in mind guards that are hinged like a door, or which have sliding or rotating sections which expose necessary parts without being removed entirely.

When installing a new guard it is usually worth while to talk with the operator of the machine and get his ideas; he may have some worth-while suggestions and if he feels he is being consulted about it his attitude toward the guard will be much more friendly.

Above all, let me say for the benefit of the new man in

*Vice President and Chief Engineer of the Liberty Mutual Insurance Co., in an address before the National Safety Council

GARLAND

Where Loom Harness Critics are busy.

The user of loom harnesses is by no means as critical of their quality as we are critical of our own work. The care with which our harnesses are made and the rigid inspection which each harness receives at each process in its manufacture are bound to produce harnesses which are as good as can be made and also harnesses which are always uniform in quality.

Our men are good critics.

TRADE MARK

GARLAND MFG. CO.
SACO, MAINE

Your Trademark Questions Answered in This Free Book—For instance:

Will I profit by trademarking my goods?
Can I afford to trademark my goods?
What will it cost to design a trademark?
Shall I use gold or silver, or a blue or an orange or green?
How shall I apply the trademark on my goods?

FREE—This 48 Page Book Just Mail us Your Business Card

The answers to these questions are representative of the information you will find in this free book. One entire section is devoted to textile trademarks exclusively. Drop your business card in an envelope and mail it to us today for your copy. No obligation to you whatever.

KAUMAGRAPH (DRY) TRANSFERS

Kaumagraph Company, Sole Mfrers.
Box 206, 209 West 38th St.,
New York City.
Branches at Boston,
Chicago, and
Hamilton, Ont.

A Sure Way to Better Lubrication

and a substantial reduction in oil bills, is to use

DIXON'S
Ticonderoga
Flake Graphite

Dixon's Ticonderoga is the original flake lubricating graphite sold for years in the red tins. It has outlived many competitors because it is a good product, carefully prepared and uniform in quality.
No doubt you have a can in your cupboard now for use in an emergency. But why wait for an emergency? Ward it off by using Dixon's Flake Graphite or Dixon's Graphite Grease on all your machines regularly. We will gladly tell you how.

Write for Booklet No. 36C.

JOSEPH DIXON CRUCIBLE CO.
Jersey City, N. J.
Established 1827

ADDITIONAL YARDS DAILY FROM SAME LOOMS

WHEN EQUIPPED WITH

FIBRE RE-ENFORCED SHUTTLES PICKER STICKS

AN UNDERSTATEMENT:

"TWICE to THRICE THE WEAR!!!"

THE WALRAVEN CO., 36 West Alabama St., ATLANTA, GA.
Southern Distributors.

SHAMBOW
Woonsocket, R. I.

safety work, don't give up too soon when you meet with a tough proposition in guard-building; we encountered many machines in the early days which foremen, operatives and mechanical forces all said could not be adequately guarded, but which were so guarded sooner or later. I believe there is no machine built that cannot be equipped with some practical and reasonably effective guard, if the nature of the hazard and the character of the operations are thoroughly understood.

The material used in a guard will depend somewhat on the conditions surrounding the machine to which it is to be applied; if there are parts underneath the guard that should be observed, woven wire, perforated sheet metal, or expanded metal may be advantageous, the main point being to have the guard of sufficiently heavy material and so braced that it will not easily be bent out of shape, and without openings so large that a finger or other part of the body may project through the guard and be injured in the working parts. Solid sheet metal or cast-iron guards are very effective in certain locations where it is not necessary to see beneath the guards, and where it may be desirable to keep out dust or dirt from the machine parts. Where only one or two machines are to be guarded it is usually less expensive to use sheet metal, but where there are a number of similar types which justify making up a pattern, cast iron may be the least expensive and most satisfactory in the long run. The use of wood is generally to be avoided, although it may be necessary in chemical industries or other locations where a metal guard would corrode rapidly. It may also be considered permissable in locations such as carpenter and pattern shops, where there are facilities for making up and repairing wooden guards readily, and where the addition of a few such guards would not add seriously to the fire hazard which already prevails.

Unquestionably the best method is to get the machine from the builder already guarded. Most of the standard machinery manufacturers have designed guards for their equipment and will furnish a machine with first-class, serviceable, well-designed guards, if the guards are specified at the time the machine is ordered,—although they may leave them out in order to save cost if this specification is omitted. Where the machine builder protects the machine in the beginning the cost to the purchaser is minimized; at the same time the danger of an accident after the machine is set up but before it can be protected, has been eliminated. Safety specifications should accordingly be used in placing an order for any new machinery.

Unfortunately there are many unguarded machines in most factories at the present time, and for this purpose it is necessary to have guards made up for application to the machines already in place. Where the plant is sufficiently large to justify it, it pays to have a regular guard-building gang of one or more men depending on the size of the plant, who are trained in the best methods of constructing guards and who can carry the work along to completion without much further oversight when they are once broken in on it.

In the case of smaller plants or those in which the number of guards to be built is limited, it may be preferable to call in one of the outside designers of machine guards, of which there are several responsible concerns in different parts of the country, and have them submit a proposition for protecting all of the machinery that needs it.

In most states there are reductions in the compensation insurance premium for machines that are guarded in accordance with certain minimum standards; it is always well for those who are installing safeguards to be familiar with the insurance standards, so as to get the maximum benefit of any rate reduction that is allowed. These standards harmonize in general with the state standards and trouble is best avoided by making sure that the guards are up to standard before they are put in.

Water—Its Uses in the Textile Industry.

BY C. C. HARDING.

It is commonly conceded in the textile industry that there exists a real necessity for the right kind of water—water that is clear and free from iron salts, water absolutely soft and, other things being equal, the highest grade of textile mill product can only be produced when such water is used. It is significant that mills operating with such water do so much more economically than others using water from which the mineral impurities have not been removed. This ideal water is rarely found in nature, however, it can be cheaply produced artificially and there exists apparatus that has proven its ability to unfailingly supply mills with this important adjunct.

The dissolved salts in water which are harmful in textile processes are the salts of lime, magnesia and iron. The suitability of any water for textile purposes is in inverse proportion to the lime, magnesia and iron present—the more of these, the less suitable is the water. Thus it happens that the great textile centers of the world were originally located in those favored spots where clear, soft water was to be had. However, the density of subsequent population, with its accompanying pollution of water supplies, changed all this and today virtually all textile mills confront the necessity of artificially obtaining such water.

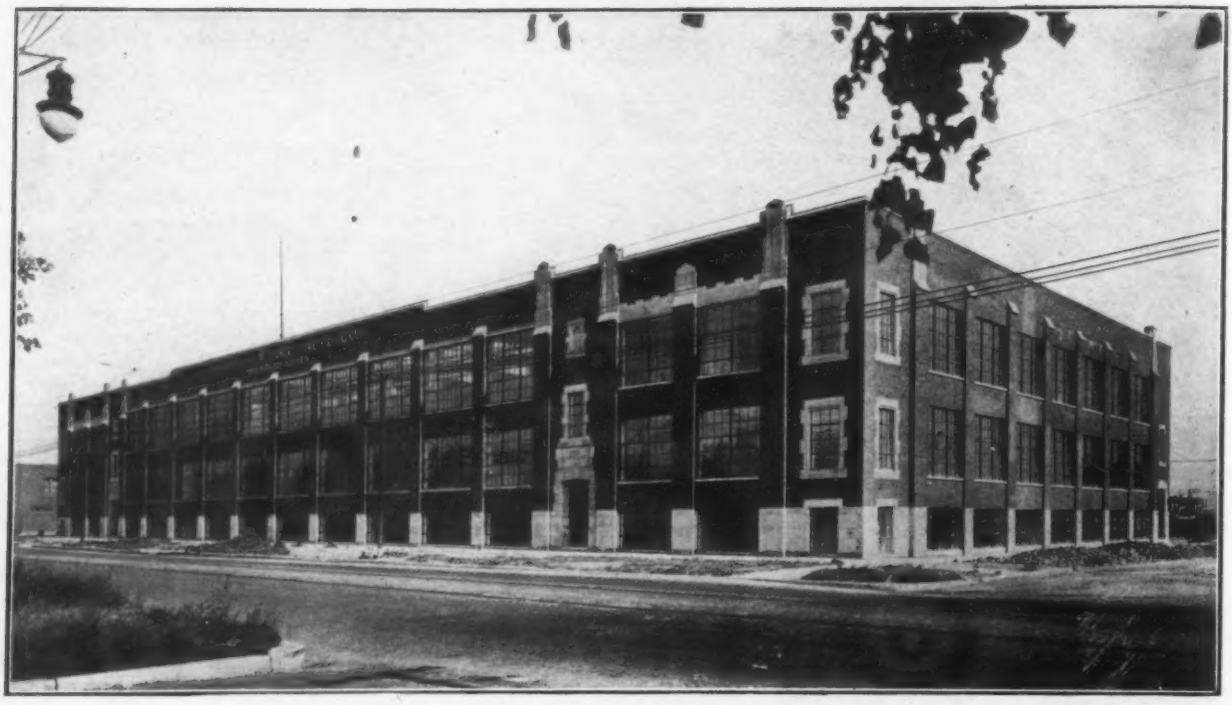
Formerly a water of say 3 to 4 degrees of hardness could not be treated, because the so-called lime-soda process, the only one then known, could not produce a water softened below that point. Millions of gallons of such water are now being softened annually by the zeolite process in textile mills.

The soap-destroying property of hard water may be regarded as the basis of almost all the trouble caused by it in textile mills. The initial step in almost every case in the handling of silk, cotton and wool involves the use of soap in boiling off or scrubbing. In that initial step hard water will produce effects the result of which will be felt even after the fabric is in the hands of the ultimate wearer.

When soap is added to water containing lime and magnesium, the lime and magnesium combine with the fatty acids of the soap, making oleates and stearates of lime and magnesium which are insoluble and extremely sticky curds. These curds falling on the fibers, yarn or fabric form so-called soap spots which can never be washed off, give a harsh feel to the goods, and are the direct cause of spotty dyeing and lusterless finish.

The turning out of uniformly high-class goods is a practical impossibility where the water available for the process contains even only a very small degree of hardness. Hard work and eternal vigilance will keep the quantity of goods spoiled, by uneven dyeing and the other ill effects

Extracts from a paper prepared for the Southern Textile Association.



The above is a sample of a number of buildings we are erecting for Industrial purposes in various sections of the country.

We Also Build

Hydro-Electric Developments — Steam Power Plants

Foundation Work of Every Kind — Shoring and Underpinning

Docks — Mine Shafts — Bridges — Tunnels

We take any size contract--large or small.

THE FOUNDATION COMPANY

CITY OF NEW YORK

ATLANTA
NEW ORLEANS
CHICAGO
PITTSBURGH
DETROIT

SAN FRANCISCO
SEATTLE
VANCOUVER

MONTREAL, CANADA
PARIS, FRANCE
LIMA, PERU
HAVANA, CUBA
TAMPICO, MEXICO

of a hard water, at a minimum, but will never completely eliminate this loss. Hence the mill, for the sake of the quality of the product as well as for the economy in operation, must have the softest water possible for every step of the process.

First consider the disadvantage of untrained water in boilers. All natural untreated waters will deposit scale of some sort, which may be thin or thick, soft or hard, according to the nature of the water and the conditions under which the boilers are operated. Thus, scale of any kind whatever, even in the form of sludge, is a source of danger in the boiler room, apart from its causing needless maintenance items such as boiler cleaning, tube replacements and boiler repairs. But, more important, this scale or sludge is directly responsible for a large wastage of fuel—the common consensus of opinion is that one shovel out of four is saved in boilers that are fed with non-scaling water.

Where boilers contain scale, sooner or later the scale, if not frequently removed, will crack, and through these cracks water enters, where under heat and pressure, it decomposes the salts in the water and possibly the scale, freeing acids, such as hydrochloric and sulphuric, which quickly attack the boiler metal.

The most dangerous salts in boiler waters are magnesium chloride and nitrates. The latter are not very common, but the former is, and, contrary to the general idea, chlorides of calcium and sodium are of little danger since they do not easily decompose, but in the case of magnesium chloride, care must be taken to see that neither scale nor sludge is allowed to accumulate, as corrosions usually take place when such is present.

Scale should be prevented by doing the necessary treatment of the water outside the boilers. The zeolite softener is offered as an unfailing solution of this problem since its delivery is water containing no calcium and magnesium salts.

Let us now examine some of the applications of soft water to the various manufacturing processes.

Silks of all kinds processed with soft water, whether in the piece or in the skein, are delightful to the feel and beautifully, evenly and brilliantly dyed thus commanding a favored position in the market.

In working silk before winding, it is subjected to a soaking process in a strong solution of castile soap and neat's-foot oil to give it the necessary softness and pliability for the winding operation. If the soaking solution is made in hard water, the lime soaps are precipitated in it and mat the fibers, making them exceedingly difficult to wind. A softened water, absolutely free from lime and magnesium, on the other hand, produces perfect saponification and penetration of the soaking solution. The silk yields readily to the soft water and comes from the solution in a well-prepared state of pliability. No lime soap specks can be formed to stick to the fibers and afterwards cause the silk to reharden. Finally, such water will materially quicken the soaking process.

In the degumming or boiling off soap again enters in the process, with the important difference that boiling off calls for greater quantities of soap and water than the soaking. Consequently, all of the ill effects of soap dissolved in hard water are intensified in the degumming operation. The danger from soap specks is much greater in that the precipitated lime soap sticking to the silk frequently first discolors it, then partially decomposes and finally often causes the silk to crack.

There is an average of 50 per cent saving of soap when soft water is used and this is practically irrespective of the water's original hardness content.

The precipitation of the lime soap on the silk renders the goods harsh to the touch. Zero water on the other hand leaves the goods delightfully soft to the touch. The proper handle and luster is imparted in the processing of piece dyed silks only when an absolutely soft water is used. The extremely harmful effects of the lime soaps, due to hard water, which adhere to the silk in spots and streaks are pronouncedly felt in the operation of weighting the silk. The sticky lime soap prevents the weighting solution coming uniformly into contact with the silk. Wherever the fiber is overlaid with the lime soap the tin cannot fasten itself to the silk, which causes the "hungry spots" that make the dyer complain, and rightly too, for since the tin acts as a mordant or fixative the "hungry spots" will always show up duller than the rest of the fabric, and give the unevenly dyed appearance that is the bane of every dyer. This cause of uneven dyeing disappears, of course, in dye houses using soft water, which is free of the least trace of lime and magnesium.

Not the least of the objections to the use of hard water in weighting is the actual loss of tin that always occurs when the silk has been processed in water containing lime and magnesium. The curdy deposits on such silks are, as has been already pointed out, oleates of lime and magnesium.

Cotton bleachers' and dyers' preference for soft water for their processes is shown by the location of the bulk of bleacheries and finishing mills in New England, where comparatively soft waters abound, instead of in the South, where, although many spinning mills are to be found, bleacheries and dye houses are not so numerous.

The first operation of cotton bleaching, boiling off, requires soft water for very much the same reasons that soft water is used in stripping silk. The resin soap used for the preliminary boiling where the lime boil is used, reacts like other soaps with the lime and magnesium salts in a hard water. However, instead of making stearates or oleates of lime and magnesium, as do the other soaps, resin soap makes resinates of lime and magnesium, which are just as insoluble and even more sticky. These resinates precipitated on the cotton yarns or cloth give rise to the same kinds of troubles as the soap on silk. The finish of the goods is deteriorated and satisfactory dyeing or printing subsequently is made difficult.

The effect of boiling cotton with alkali is to remove the pectic acid, the fatty acid, part of the cotton wax, and the bulk of the coloring matter, it also swells up the motes (pieces of cotton seed). The bleach destroys the coloring matter and the sour dissolves the lime salts and any other mineral such as iron stains.

When hard water is used in the alkali boil, the fatty acids form soda soaps with the soda, and the lime in the water immediately forms lime soaps which precipitates on the fibers. In the bleach, the lime soap is changed to a fatty acid which combines with the hardness in water forming lime soap again which remains in the goods. Bleachers frequently use a second kier boil, sometimes be-

fore and sometimes after bleaching with the objects of removing the fatty acids still remaining in the goods. Soft water precludes the necessity of more than one boil thus saving that expense.

Lime, caustic soda, soda ash and silicate of soda, the chemicals most frequently used for the boil-off, all react on the magnesium and lime salts in the raw water, causing their precipitation in the kiers as hydrates, carbonates or silicates. It stands to reason that an excess of chemicals, over and above that required for boiling off the cotton, must always be put in the kiers with a hard water. When soft water is used there is no such waste and the cost of boiling off is reduced accordingly. In addition no insoluble unremovable lime soaps are formed when boiling-off is done in zero water.

The presence of the precipitated carbonates and silicates of lime, which are inert as far as the boil-off is concerned, is far from beneficial to the process, and increases the souring required subsequently. Too much souring is harmful in that it tends to tender the fiber.

In mercerizing, the chemicals used, strong solutions of caustic soda or of zinc or cuproammonium, also cause the precipitation of the lime and magnesium salts in the same manner as already described as taking place in the kiers. Rapid and even penetration is an impossibility when hard water is used.

Water enters so largely into practically every step of the process of manufacturing woolen goods that the character of the water supply becomes the most important single factor in the production of woolens. Woolens of the highest class cannot be produced with waters of even comparatively little hardness, so that the quality of the product of any woolen mill is very definitely governed by the quality of the water available.

The faultless scouring of wool is the keystone of the entire process of manufacture of woolen goods. When a water containing lime and magnesium is used in scouring, the gray-colored oleates, formed by the soap destroyed in such water, cling to the fibers giving a dingy, dirty appearance to the wool and imparting to it a sticky feel, which is injurious in all subsequent operations.

The soap-destroying effect of a hard water used in scouring greatly increases the cost of the process. Fine qualities of wool are best scoured with well-made soaps free of alkali. Generally speaking, from three to five pounds of such soap per 100 gallons are required for the scouring bath. A water absolutely free of lime and magnesium will produce first-class wool with three pounds, while waters of even moderate hardness will often require more than five pounds.

The oleates, the sticky lime and magnesium soap curds, interfere in every subsequent manipulation of the wool. Carding machines handling wool covered with soap spots have their scrapers rapidly clogged up, causing a loss of time in clearing them. When such wool is stored, the soap spots decompose and impart a very unpleasant odor to it which tends further to lower the quality. When this wool is turned into yarn, there is a poor yield, the yarn is uneven and is not easily drawn off from the spools later on. The soap spots make dirty, unsightly spots in white goods, and cause lighter or darker splotches and streaks in the piece, according as the soap spots attract and repel the color in the dye bath.

These defects completely disappear when zero water, which cannot cause the deposit of any oleates, is used in the scouring. Furthermore, comparative tests show that higher numbers can be spun from a wool free from oleates, which is, of course, a distinct advantage to the spinner who uses zero water.

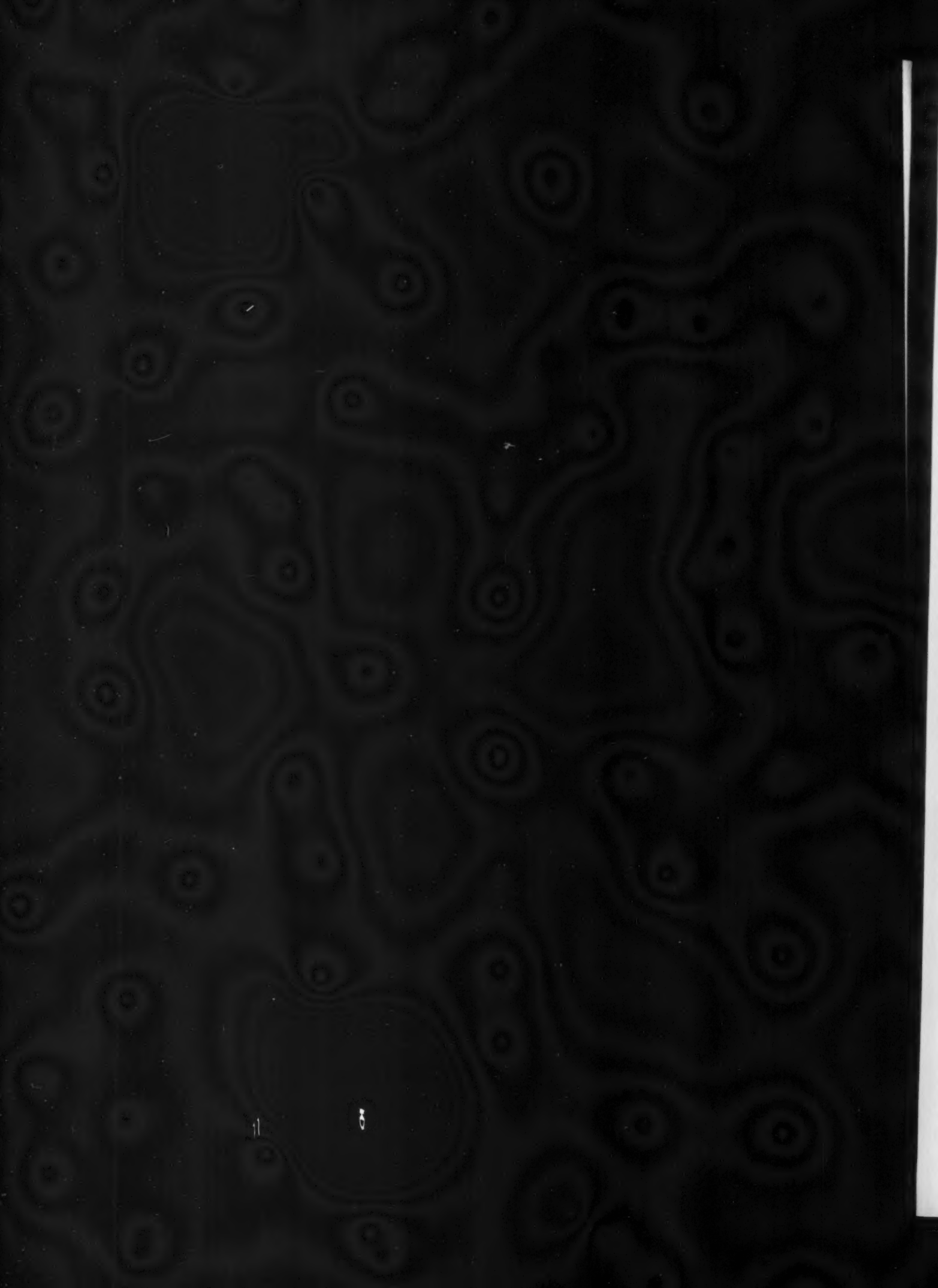
The soft, elegant feel so much desired is wellnigh impossible when the wool is processed in hard water. The wool fiber is exceedingly susceptible in this respect, and the change in results obtained where soft water is substituted for even a very moderately hard raw water is very marked.

The influence of the impurities in water on dyeing operations will depend very largely on the character of the dyestuffs employed. In certain cases the tone of the resulting color is modified by the presence of adverse mineral salts in natural water supplies. The presence of iron, however, even in very slight quantities, in the water may cause a considerable alteration of the shade, usually dulling and darkening it. Basic dyes form insoluble precipitates with lime and magnesia compounds which result in a large loss of coloring-matter and also faulty and streaky dyeing by reason of a precipitate of coloring-matter which is smeared on the material being dyed. The presence of iron in the water is also very deleterious in using basic dyes. With the substantive colors the influence of hard water varies largely with the particular dyestuff, in some cases causing precipitation and in others not. As a general rule, however, it may be taken that hard water is deleterious with all classes of dyes.

No matter what effect on the dyestuffs of the lime and magnesium salts, it is certain that the washing off of piece goods after dyeing or mordanting should always be done with soft water. Otherwise the deposition of the salts in the selvages of the goods due to the evaporation of the water, will give rise to "white lists" or "dark lists," according as the salts act as mordants or detergents with the particular dye stuff used.

To sum up, the finished product in every case, whether silk, cotton, wool or union goods when handled in soft water, is of much higher grade and hence is much more readily merchantable when zero water "as soft as rainwater" has been used for every step of the process.

It requires no unusual quality of vision to see the possibility of trouble ahead in this world situation of ours, and, incidentally, most American situations today must be considered not only in their domestic bearings but also in terms of their bearing upon the affairs of an entire world. How far off this trouble is, when we will reach it, whether its sting can be removed before we encounter it seriously, whether it is as serious as it appears or more so, whether we will come up with it finally, or whether, like the will-o'-the-wisp of our boyhood, it will skip on ahead until finally it ceases to exist as a fact in our world—these are things we do not know—cannot know. We do know, however—every serious man must admit it—that this is a time for serious thought, serious study, serious effort to provide against both the expected and the unexpected. It would be absurd to assume that because the impossible has been accomplished in the past, it must be accomplished again. There never was a time when American business and finance were more in need of care and caution and provision against surprise, than the present.—Rollin P. Grant of the Irving National Bank.



KNITTING SECTION

The Attention of Manufacturers Is Invited to Our New Model K

Producing a fabric without lines, using a latch needle, permitting speed of production, the making of heavy heels and toes and perfect plaiting.

Increased width of top and a greatly pronounced loose course for looping are features of great value.

ESTABLISHED 1865

Scott & Williams

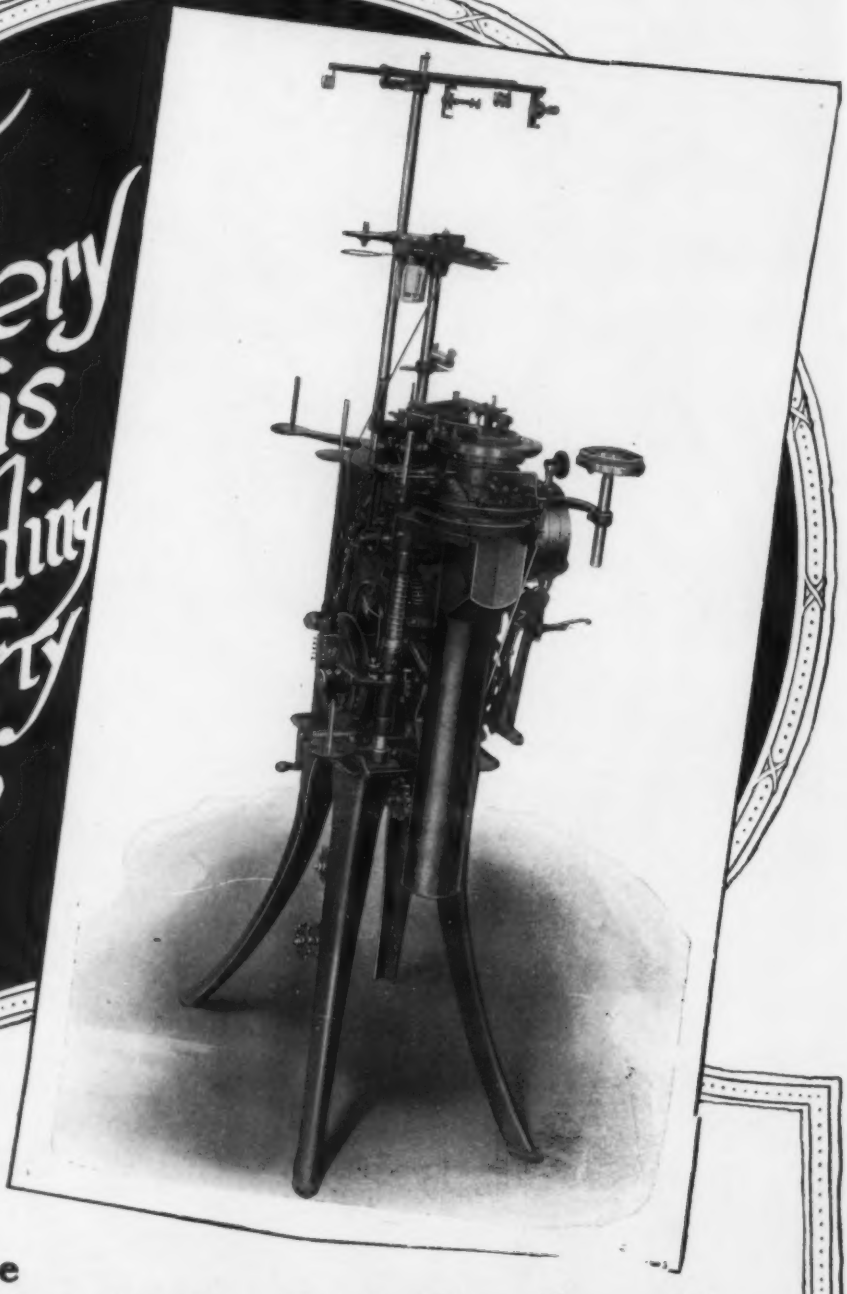
INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

The Hosiery Buyer is Demanding QUALITY



This Superior Machine Produces the Highest Quality Fabric Free From Lines

The hosiery buyers of today are demanding the highest quality they can buy,—if you can't supply them, they'll buy somewhere else.

There are different makes of knitting machines on the market, producing good fabric, but everyone knows the advantages of the spring needle machine for knitting hosiery, especially when using silk, and everyone knows that to make the finest and smoothest fabric free from any trace of imperfections it takes a WILDMAN Spring Needle Knitter.

The product of this machine finds a ready sale and a better price for the goods.

Get into this exclusive market—supply the demand for quality goods—by installing the WILDMAN Machine.

Write today for details.

WILDMAN MANUFACTURING CO., NORRISTOWN, PA.

MFG. TRADE MARK

WILDMAN

SPRING NEEDLE KNITTER

MFG. TRADE MARK

The Year in Knit Goods

It is no flattering comment on the financial interests engaged in the knitting trades that the adverse happenings of 1920 were foreseen by every important factor in the industry and not one was prepared to escape the dire results. This is the truth, nevertheless, and it applies with equal force to practically all in every industry.

Looking back over a year fraught with more perplexities than ever were crowded in twelve months of the history of the country when at peace with the world and free from internal strife, the mind's eye rests on a rolling tide of prosperity, which, during the major part of the first quarter appeared to be irresistible. Moving forward, the vision detects spots on the horizon, giving the first intimation of possible approaching recession of the tide. What everyone at some time said or felt was inevitable was being outlined against a clouded sky. But still no retrenchment, until the end of the second quarter. Then began the real struggle between producer and wavering confidence in home and foreign markets. It had not been terminated at the close of the year, when the knitting industry, with which this review is intended to deal, was more nearly at a stage of complete stoppage than at any time before. The solvency of this industry as a whole, under unprecedented conditions; the superhuman handling of the drifting craft; the patience of industrial chiefs large and small; and the dogged determination to weather the storm stand out distinctively in a retrospect of the textile trades.

An excess of confidence has been born of the sudden collapse of the readjustment movement which was assumed to have set in early in 1919. It seemed inconceivable that the day of reconstruction could be deferred, that prosperity could be checked. Factories were speeded to capacity, there was employment for all at the highest wage ever paid anywhere in the world. Prices were higher than ever had been recorded, and the public had the money to pay them.

Then it dawned on the minds of some of those who were entrusted with the shaping of the country's financial policies and conserving credit, that inflation was being carried to the extreme; that there must be called a halt if calamity were to be averted. Drastic measures were resorted to for warding off the full effect of what everyone said was coming, and it hastened the coming. Whether the federal reserve board might not have mellowed its warning and made less severe its restrictive measures must be left to individual judgment. The raising of the danger signal was the inspiration which decided the distributors of knitted goods to trim sails. Since they first intimated that prices were not satisfactory, prices of hosiery have declined more than fifty per cent, and at the close of the year still were not within sight of stabilization. Since then, too, fortunes amassed in the previous two years have been swept away and the year was productive of additional losses. No one from the cotton grower to the holder of the finished product, escaped, with the retail merchant as the one exception. The public pronounced judgment on him several months ago, and the result of that finding was during the closing quarter of the year, a continued check to buying and, in sequence, production, and presaged a "hard winter" for many thousands of wage workers and not a few persons not wholly dependent on earnings who had yet to feel the full force of the blow of industrial stagnation.

Price Recessions.

One of the problems which it was sought to solve as values dropped from week to week was, "How far can prices descend in relation to prewar?" In the underwear manufacturing trade it was stated with assurance, bearing the earmarks of confidence, that three times prewar would be the minimum of value. As the season for buying for spring 1921 wore on and merchants gave no heed to prices or prospective needs, the guess was revised to twice prewar. By the middle of December an underwear manufacturer set the pace by announcing prices about one-third under those of one year before, but even this was not appealing, and, as for some time before, for every dozen of garments sold production was being curtailed two dozens.

In the every-day small-lot transaction in hosiery arbitrary values played no part. There appeared to be more of it than the domestic and foreign markets were willing to absorb in the disturbed conditions in world commerce and finance. While mill prices went down an average of 50 to 55 per cent, resales were frequent at a loss of ten to fifteen per cent to distressed holders, frequently representing declines of 60 to 65 per cent from actual mill values of ten months before. The nearest approach to prewar value in the retail store was in the restoration of the ten-cents-a-pair stocking and the ten-cent undervest in the five-and-ten-cent stores.

"What was prewar value?" frequently was asked while manufacturers and merchants were fooling themselves and trying to fool the public with the notion that there can be an arbitrary basis for price. For the five cotton years 1912-13 to 1916-17, a period during which cotton sold as high as 27 cents and as low as seven and less, the mean was about 12 to 13 cents. Cotton therefore is considerably nearer prewar than twice that value. A study of the tabulated figures relating to crop and consumption, forces the conclusion that supply and demand then had more to do with regulating price than an arbitrary prospective. Inconsistent though it may appear, December found some counts of yarn selling under the highest prewar price since the readjustment following the civil strife. Single 2-ply skeins 40s were sold at 40 cents. The peak reached prior to the war was 45. Single 30s tying-in reached 33½ cents, the top before the war, and in December were bought at 30 cents. The year 1920 left the problem of value to be solved in 1921.

Surplus Reduction.

If the hosiery industry shall become more nearly stabilized as a result of revelations in 1920, the slump in values may not have been an unmixed blessing. From five to 35 per cent of the hosiery knitting machines were idle in January, according to carefully compiled statistics, being operated, however, to help capacity. By September, as shown by the same compilation, from 15 to 55 per cent of these same machines were idle, waiting for more than 87,000 dealers to start them going. Estimating from full time capacity production, it probably is no exaggeration to say that the closing of mills for varying periods

was equivalent to a complete shutdown for three months. And it is not recorded that anyone of the 105,701,708 population went barefoot because of a scarcity of stockings. On the other hand, some lines were crowding warehouses and threatening the solvency of holders. There was such a backing up of silk and low end hosiery as the most conservative operator never contemplated. A part of this could be attributed to disturbance of foreign markets, which had thrown back on exporters many hundreds of thousands of dozens of cotton and artificial silk hosiery. There accumulated too much of it, notwithstanding production for a year never was lower or exports in greater volume.

Underwear as a whole did not suffer horizontally with hosiery from the slaughter of prices. Light weight garments for the year had passed from mill to distributor before the retrenchment became pronounced. The losses on spring lines sustained by manufacturers came with the almost complete cessation of production for spring of 1921, and in September from 47 to 71 per cent of the underwear knitting machinery was idle, as compared with 10 to 40 per cent in January. Much of the idleness among mills making heavy weight underwear was due to strikes, which in the circumstances also may not have been an unmixed blessing, for had factories been operated to capacity there would have been such a surplus as would have bankrupted manufacturer or jobber—perhaps both. As the matter stands, there has been underwear, light and heavy, for all that wanted, and millions of dollars worth of the latter remain to be disposed of. Most of the surplus stocks, however, are in second or third hands, mills having pretty well cleaned up, by reason of the fact that distributors had called for advance delivery, so far as that was possible, while labor was unwittingly diminishing the possible excess when they might have earned that which later was not available to the factory help.

Liquidation and Cancellation.

Through the entire range of knitted goods there was heavy liquidation of stocks, often at the expense of innocent persons. Facing a period of dubious values, holders confronted with heavy tax payments to be met in December assumed staggering losses. Sacrifices of 30 per cent, representing almost 50 per cent from mill value, were not uncommon. As in hosiery, underwear was thrown on the market for what it might bring, regardless of whether it could be replaced to fill gaps that were being created in jobbers' warehouses and the establishments of retailers. But worse than this was the practice of a species of brigandage, not in the taking of what belonged to another, but in denying it to him.

It has been stated that the wave of crime which has been sweeping over the country was due to a depravity traceable to the carnage of war. Whether a psychological effect of this deterioration of morale can be held as accounting for total disregard of honor in business, the fact remains that not in any previous twelve months was there more widespread wanton violation of the law of contracts. For a period there were five cancellations of large-lot contracts for every small-lot order placed. When cajolery and deception failed a canceller, he would take an arbitrary stand, and there was recourse to even threats of reprisal and worse. For the time "The American sport" was a largely absent element in knit goods merchandising. There was a denying the sacredness of a contract that was deplorable, and it is noteworthy that cancellations and return of a purchaser's merchandise was carried to an extent that led to a combination of all textile interests for restoring observance of moral law and the statutes and averting a further "black smirch on American business morale," this coming together of allied interests culminating in the formation of a National Bureau of Commercial Contracts, still in the embryonic state but promising of a life of usefulness.

Mill Help and Wages.

Wage adjustments downward come in cycles. One of these cycles seems to have been due in 1920. It was a repetition of 1907-8 and 1893-96. In each of those periods, as in 1920, the mill help available was in excess of demand, and last year there had to come a violent recession from the unearned payments for which employers had been "held up" when they were as much concerned with completing orders on schedule as they lately were in getting them. It was inevitable that labor must share in the readjustment, and here again there can be no such arbitrary base as a ratio on prewar. Reductions in knitting mills which went into effect during the last quarter of the year range from 15 to 40 per cent, and as even the more radical cut did not permit production at a cost for making a price satisfactory to buyers, it was a question whether 1921 would not witness further declines in the scales. It was established, however, that mill help, fully alive to what is required of it, is showing a more nearly normal degree of efficiency, a return to which would be a partial reward for the disappointments which have been suffered. For example, in factories where a work week comprised only 48 hours and included no part of Saturday, the help is working Saturday forenoons, 54 hours a week, and the week's earnings are almost as great as previous to a 25 per cent reduction in the wage per unit.

Thus was being solved one of the problems carried into the new year. The gradual return of the idle to their former employment, even at somewhat reduced pay, is to restore the country's purchasing power. As this increases, logically more of the idle will be sought, and step by step, industry will take on new life. With the settlement of vexatious economic questions, reconstruction, long delayed, will proceed, and the "hard winter" of 1920-21 may be reverted to as the darkness before dawn.

Declines in Commodities.

By reason of practically wartime wage scales prevailing until well toward the end of the year, declines in finished product were not so sharp as in raw materials, as instance cotton, wool and silk and the products therefrom. In a few months tram silk fell off from $19.50 a pound to around six dollars—about 70 per cent. Hosiery made from tram silk is held at prices 40 per cent less than those which jobbers were paying when silk was at the peak. While cotton has gone down approximately 65 per cent from the top, the average price of cotton hosiery or underwear is down about 40 per cent.

Declines in yarns have been of more serious moment to manufacturers than in their mill products. The latter they could make or leave unmade, hold or sell. Their yarn commitments could not be evaded. The experiences of a few are sufficient for indicating what befell the knitting trades as a whole. One manufacturer paid $600,000 to be relieved from his obligation to a spinner. Another had suffered a loss of $400,000 when raw silk fell to $10 a pound. Manufacturers rated in the small class were glad to be let out of their contracts by a payment of $75,000 to

$90,000. They assumed these losses while sustaining those which followed as a consequence of cancellations from their customers.

It is to the rare credit of the knitting industry, however, that readjustment, so far as it has proceeded, was effected without really serious difficulties; that notwithstanding heavy, untold losses, there were few failures in the year of greatest distress in the industry.

Trade Practices.

The exigencies of the year just ended brought trade practices to the fore as a semi-national question, in hearings arranged by the federal trade commission, which devoted considerable time and investigation to the matter of a seller guaranteeing prices against his own declines. The proponents of the guarantee were, largely, merchants who would have all to gain and nothing to lose by price protection. So far as the commission's records show, not a knitting manufacturer favors the guarantee and only a small per centum of the distributors oppose it. It cannot be extended to the cotton grower, who must take his chances with Nature. It is not extended by the spinner to the manufacturer, nor can it be applied to the ultimate consumer. The commission has yet to rule whether, in view of the fact several large interests can be given no guarantee that their market will not decline, it shall be declared feasible in application to the middleman.

Under rulings and prospective rulings of the commission, such trade descriptions as "Merino" and "Cashmere" probably will date their disappearance from 1920, and it is doubtful whether a stocking of 21 inches of silk leg and mercerized top, heel and sole can be described with safety as silk.

The knitting industry went through the fire in 1920 and came out singed but not badly scarred. As to the units, there will be a survival of the fittest. Developments of the year proved that production facilities are in excess of needs; proved the need for a higher standard of business morale and better standards for products, and proved that much of the demoralization might have been averted had there been less reluctance to exchanging confidences and more of the coming together for a comparison of notes.

Knitters Convene at Chicago

An open price exchange as a means toward stabilization and keeping the market on a more nearly even keel in the economic interests of industry and the public; the open shop, in which labor may offer its services unhampered by dictation from professional agitators; approval of the announced policy of the National Bureau of Commercial Contracts; and the distribution of monthly statistics of knitting machinery in operation constituted the main planks in a declaration of principles adopted at a meeting of Central West knitting manufacturers at the Congress Hotel, Chicago, December 7.

Before entering upon a discussion of trade subjects, the meeting resolved itself into an organization of the Central West Division of the National Association of Hosiery and Underwear Manufacturers, and elected Roger N. Kimball, of the Allen Company, Kenosha, Wis., president.

Mr. Kimball, whose election was effected by a unanimous vote of acclamation was at once summoned to the chair by D. L. Galbraith, American Textiles, Inc., Bay City, who, as vice president of the National Association, resident in the Central West, called the meeting to order.

The meeting went into executive session for the forenoon, for knitting manufacturers only, and on a call from the floor for a committee on resolutions Chairman Kimball announced the appointment of the following:

Joseph H. Zens, Milwaukee (Wis.) Hosiery Co., Chairman.

D. L. Galbraith, American Textiles, Inc., Bay City, Mich.

J. J. Phoenix, Bradley Knitting Co., Lelavan, Wis.

Ralph E. Rollins, Des Moines (Ia.) Hosiery Mills.

J. O. Wells, Cooper, Wells & Co., St. Joseph, Mich.

Deep consideration for the welfare of mill employees was manifest in an exchange of information as to the extent to which wages have been reduced for meeting an emergency precipitated by the so-called strike of the public and the attitude of the distributing trade toward prices at the factory. Mention was made of a southern mill which lost an order for 2000 dozens of cotton hosiery because it could not name a price to match that of a competitor. Subsequently wages at the mill were reduced 40 per cent, the deepest cut yet reported, enabling the mill to meet the price of the competitor in question.

Of 26 manufacturers reporting on the wage question a majority either had reduced the scale or contemplated doing so very soon, the reductions which were announced ranging from 15 to 30 per cent. Mills in which reductions have gone into effect, some time ago dispensed with the bonus. Where the wage scales have yet to be disturbed, the bonus, in most instances, is no longer being paid. It was apparent manufacturers were reluctant to plan any general reduction, although it was stated by a number that revisions were forced on them. In some mills reductions are being deferred until operations can be conducted full time, employers hesitating to lessen an employee's earnings while machinery is kept going only half time, as is the situation in most of the mills not entirely closed down.

Discussion of economic conditions brought the open shop to the fore, and a short but strong pronouncement against the closed shop was made, preceding the unanimous adoption of a resolution condemning the latter as inimical to the best interests of employee, employer and society at large.

"If conditions do not improve," said one manufacturer, "we shall have to pay our help less, and under no circumstances would we agree to the closed shop plan. Our employees are prosperous and content and favor the open shop for a continuance of the relations that always have existed in our mill."

Chairman Kimball called on manufacturers by name for their views on trade conditions, present and prospective. With one or two exceptions, the mill heads present ventured the prediction that as hosiery probably had suffered more severely than any other textile line it would be the first to experience sharp recovery, and no one doubted that healthy revival was in prospect. It was the prevailing

ALWAYS FIRST WITH — THE — LATEST

ALWAYS FIRST WITH — THE — LATEST

BANNER

FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

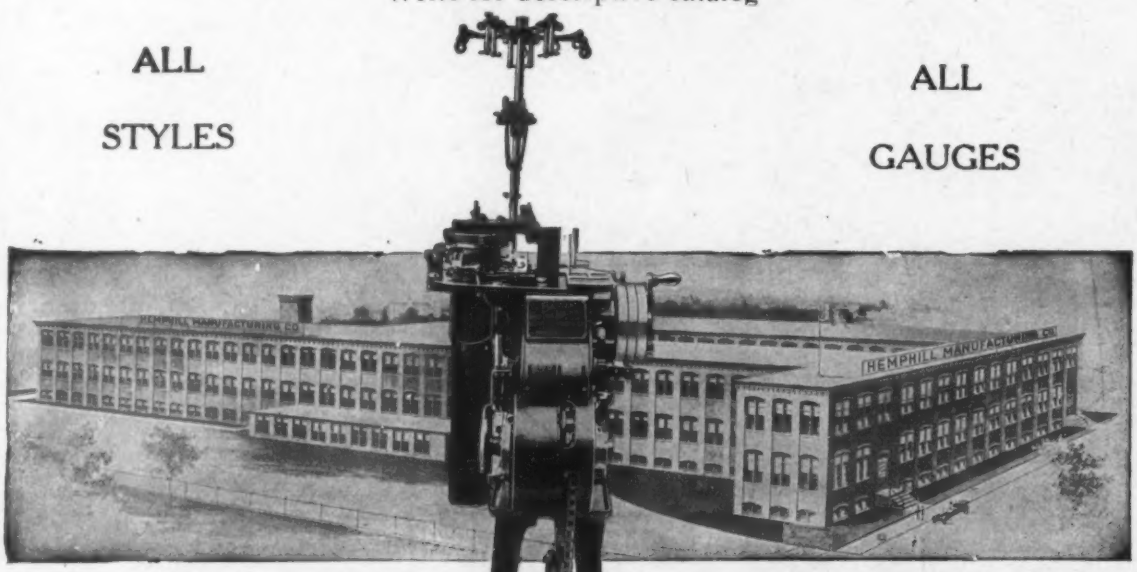
Four important things to consider when buying Hosiery Machinery.

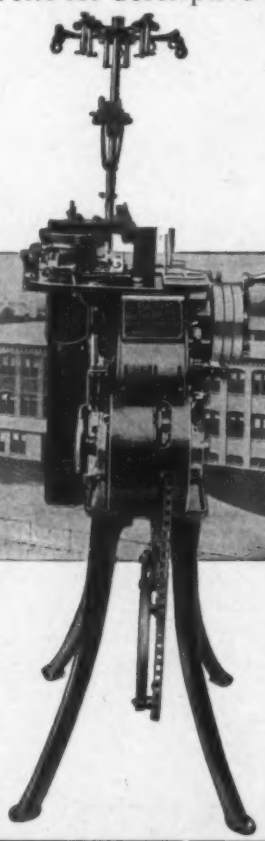
ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

Write for descriptive catalog

ALL STYLES

ALL GAUGES





HEMPHILL COMPANY

Main Office and Factory.

Pawtucket, Rhode Island.

Southern Office and Show Rooms
912-913 James Bldg., Chattanooga, Tenn.

Philadelphia Office and Showrooms, Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts., Philadelphia, Pa.

sentiment, however, that the situation calls for conservatism, caution in making commitments and the deferring of the naming prices for future until there has come a substantial show of a trend toward stabilization.

One mill reported a greater volume of spring business booked than in any preceding year with a single exception. This mill is operating full time with the heaviest payroll in its history, and the executive speaking for the establishment counselled going ahead in a modest way. "We went out with our lines for spring," he said, "believing in our merchandise, our prices, our customers and the American people. It has been our aim to keep the mill running; we do not want the bread line this winter, neither do we want to crowd yarns or force raw materials down to ruinous prices."

"Don't attempt to make prices to compete with what you hear as to prices of distress goods," was the injunction of one of the larger manufacturers in the meeting. "If we engage in such competition," he added, "we will be halting stabilization, now on the way. When we let the legitimate market down, distress goods will sink still further and we get nowhere. No business is to be gotten by attempting to match your prices with distress figures, so that those who do attempt it gain nothing and only aid in delaying the day of settled prices when all of us can operate with safety."

This sentiment was emphasized by the remarks of another manufacturer who stated his company had received more complaints because of price reductions than for adherence to prices. "Continually dropping prices will not bring merchants to market," was the explanation of jobbers and retailers who were quoted in defence of their attitude.

"They will buy only what circumstance forces them to take for keeping their business going," said a manufacturer, "and it should be plain that so long as they find holders willing to part with goods at any price obtainable, simply to convert the merchandise into cash, buyers will look for the lowest possible figures and play one holder against another. If mills established prices, stuck to them and exchanged price information freely through some sort of clearing house, there would come an end to dickering and misrepresentation on the part of buyers and there would be business on a basis safe for all."

This suggestion seemed to emphasize in the minds of many present the expediency of an open price exchange for hosiery, patterned after the plan in effect among separately organized underwear manufacturers. The procedure was explained in brief by Mr. Galbraith, who stated it was not intended that mills participating in the open price exchange report their sales. Each participant reports only his prices of completely described lines, and makes no further report until he revises his prices. Reports are sent to the secretary, on forms designed to simplify the work of supplying the information, each participant's prices being reported by that official to all the others. Thus each manufacturer cooperating in the exchange is kept informed of the prices of his competitors, and misrepresentations as to quotations are easily and effectively met, and buyers put in a position where they can be called on to prove alleged reductions by one or more mills for beating down prices of others.

Most of those at the meeting were favorable to the installing of an open price exchange, to be conducted by the National Association of Hosiery and Underwear Manufacturers, and a resolution to that effect was adopted without a dissenting vote. It seems probable that at the outset two group exchanges will be operated—one for mills selling to jobbers; the other for direct-to-retailer mills.

Price stabilization, it was indicated by the report of a mill selling to the retail trade, is the corner-stone for the building of a new and substantial market. This mill had completed its November shipments, and to the satisfaction of the management, received less than 3% per cent of cancellations of orders applying to shipments, which, in the circumstances, was regarded quite satisfactory, and was attributed in the main to the fact that its customers had assurance of mill prices staying where they had been put—on a comparatively low, but fair, basis.

The outlook for satisfactory business was regarded by several speakers as encouraging, For the present, it was stated, there prevails in the trade the feeling that retailers clinging to arbitrarily high prices are the stumbling block to instant prosperity. That they will fall in line early in 1921 with the lower levels of values established by manufacturers and jobbers was viewed as admitting of question, the effect of which will be a return to normal buying by the public and a pressure on mills, which in turn will be followed by the return of thousands of idle operatives to work and earning.

The work of reconstruction has yet to commence, it was pointed out. This work also has been awaiting stabilization of wages and prices of materials, in both of which the tendency necessarily must be downward. Railroads, public utilities, and building operations are for the moment being restrained in the forward movement by credit conditions, which, according to the federal reserve board and banking interests in general, are fast improving. With the ban on loans lifted, the taxes and tariff questions settled, so far as the action of congress can be outlined, and under the rejuvenating influences of springtime, business, it was felt by several speakers, would be invested with new life by the end of the first quarter of 1921. "Don't cloud this vision by going out with prices that might be affected by conditions in the distress goods market; operate conservatively, deliver what you sell and see to it that buyers are not permitted a loophole for cancellation," a manufacturer pleaded, and it was thought advisable that so long as holders are liquidating at bankruptcy prices production be kept down to the lowest stage consistent with the desirability of such distributions of earnings as will ameliorate conditions among the working classes.

Prices of knitted goods next year, it was believed, will be in the same relation to prewar values as in commodities as a whole. Cotton, it was pointed out, is being sold in the open market at less than the cost of producing the present crop, an inequality that will disappear as business generally rights itself.

Prices will advance in response to demand, but recessions are to be looked for and moderate fluctuations may be frequent, but these are to be expected as a part of the process of final readjustment, was the thought of mill executives in and out of the meeting.

At the suggestion of a hosiery manufacturer in Tennessee to the general office of the Association, the matter of a monthly census of knitting machinery was taken up for consideration. It had become a question among some manufacturers whether, with all of the available hosiery equip-

ment in operation, there might not be excess production in some lines. Interest in the matter had been stimulated by the statistics gathered in September showing the number of knitting machines owned by about 350 manufacturers and the per centum of idle machines in January and August. A motion that there be a monthly census was carried by a unanimous vote, with the recommendation that when it be undertaken all manufacturers respond to the call for figures, tabulated reports to be distributed among those supplying information.

At the afternoon session the bars were let down to all textile interests, and several representatives of spinners and yarn merchants siezed the opportunity for defending the spinner against the allegation of unduly high prices. Garnett Andrews, Richmond Hosiery Mills, Rossville, Ga., who was one of several southern manufacturers in attendance, by request gave a review of incidents in his recent tour of a considerable part of Europe and his impressions of trade conditions abroad at that time and the outlook, which he regarded promising of a larger export trade from the United States. Among the speakers representative of yarn interests were:

O. J. Caron, the Caron Co., Rochelle, Ill.

Martin P. Glynn, Philadelphia, the Cannon Mills.

A. R. Newcomb, New York, the Johnston Mills Co., Charlotte, N. C.

W. C. Reynolds, Harding, Tilton & Co., Boston, Mass.

W. H. Thatcher, Standard Processing Co., Chattanooga, Tenn.

Thomas S. Tuley, Louisville (Ky.) Cotton Mills Co.

Mr. Tuley saw no hope for a continuance of the present low price of cotton, which, he said, is being delivered to spinners at less than the cost of growing the fiber. It is obvious, he stated, that cotton will command better prices, and he looked for an upward movement with the demand for yarn which was viewed as reasonably certain to develop promptly when activity in textile mills is resumed.

Mr. Reynolds became a trifle caustic in his reference to manufacturers who had resorted to the use of harsh words in criticism of spinners. Mr. Reynolds said in part:

"Several of the knitters present have been very prolific in their abuse of the spinner. I have not been commissioned to defend such men as Mr. Whitman, Mr. Harding, Mr. Tiffany, Mr. Sharp, Mr. Holmes, Mr. Ayer or any of the other large New England mill men. These men need no defense, and certainly anything I could say would not add one cubit to the stature of any of them. I do want to say one word, however, and that is this: that it is very ungracious, unjust and unbecoming on the part of any knitter to use harsh words in referring to these gentlemen. In times of uncertainty and doubt these men, with foresight and great ability, created these beautiful mills, which are, today, so necessary for your welfare. The knitter needs the spinner, and the spinner needs the knitter. Neither can do business without the other. The spinner has made money out of you, and you have made money out of him. These men are your friends and, I repeat, it is ungracious, on the part of some of you, to abuse them. I realize that many of the things that have been said, have been said in jest; nevertheless, what has been said is untrue, and it is also unpleasant.

"I have been asked how it is possible that the prices of yarns can fluctuate so tremendously. It seems to me that I would almost insult the intelligence of this meeting were I to attempt to explain. We all know that staple cotton, which, before the war, sold at 12 cents, or less, sold for a dollar or more during the past year. We also know that it takes a pound and a third of cotton to make a pound of yarn. Cotton selling at 12 cents therefore, costs 16 cents in the yarn: Cotton selling at $1 costs $1.33 in the yarn. We also know that the manufacturing costs since 1914 have trebled, and yarn costing 20 cents then, will cost 60 cents now.

"Then there is another thing which it seems to me I ought not to waste much time talking about, for it is a subject familiar to you all, and that is the present system of taxation. This, in my opinion, has had more to do with the high prices that have prevailed than any other factor. Then there is the question of demand. In the first half of the year the demand was greater than the supply. Without this demand, high prices and large profits would have been impossible."

Mr. Reynolds completed his address with a plea for optimism. He said that if he were a knitter or a buyer of yarns, he would estimate his requirements to July next, and purchase at the prevailing prices. He emphasized strongly the proposal that these prices were less than the actual cost of production, and he believed that very soon there would be a scramble to buy yarns, and that the present stocks of the underpriced yarns would fast evaporate, and with the increasing demand there would be a strengthening in price. "Throw away your hammers, and blow your bugles," was the parting advice that he left with the knitters.

The committee on resolutions reported the following, all of which were adopted:

Whereas, the Central West Division of the National Association of Hosiery and Underwear Manufacturers believes that it would be to the mutual interests of those engaged in the several divisions of the knitting industry represented in the Central West Division to maintain an open price exchange, with the view to stabilization of prices and averting confusion in the primary market, and

Whereas, we held to the principal that there should be a greater degree of confidence among manufacturers, and believing that an open price exchange would establish and assure continuance of such confidence, therefore be it

Resolved, That the Central West Division of the National Association of Hosiery and Underwear Manufacturers assembled in Chicago this 7th day of December, 1920, recommend that an open price exchange for hosiery and underwear and other lines of knitted goods be established and conducted by the National Association of Hosiery and Underwear Manufacturers, the information obtained from the reporting of prices to be distributed among only those manufacturers cooperating in the open price exchange.

Whereas, The Central West Division of the National Association of Hosiery and Underwear Manufacturers approves any feasible undertaking for eliminating cancellations as one of the greater evils in American business, be it

Resolved, That the action of the National Association of Hosiery and Underwear Manufacturers in becoming a member of and pledging its cooperation with the National Bureau of Commercial Contracts has the unqualified approval and endorsement of the Central West Division of the said National Association assembled in Chicago this 7th day of December, 1920.

Whereas, We believe it essential that manufacturers be kept advised as to the production capacity and machinery output of knitted goods, be it

Resolved, That the Central West Division of the National Association of Hosiery and Underwear Manufacturers urgently request that the said National Association circulate among manufacturers a questionnaire for the purpose of ascertaining the number of knitting machines in operation, in contrast with the number of machines available, and send tabulated returns, from all manufacturers reporting, to all manufacturers contributing to the information for computing a monthly census of knitting machines in operation.

Whereas, We believe in the right of labor to offer its services in the open market, be it

Resolved, By the Central West Division of the National Association of Hosiery and Underwear Manufacturers assembled in Chicago this seventh day of December, 1920, that we endorse the truly American policy of the "open shop" in industry.

The Knit Goods Market

After a long wait for a market, knit goods manufacturers entered upon the new year with little encouragement that any material improvement would be witnessed in the first quarter of 1921, except in light weight underwear, which shortly must be bought if jobbers and retailers are to continue in the business of merchandising. A forecast to the contrary would afford more satisfactory reading, but might leave the door open to bitter disappointment.

Whether only approximately true or nothing better than a wild guess, a recent report of the federal reserve banks showed that retailers reporting as of November 30 had thirty per cent more stock than on the corresponding date of a year previous. Since that report was compiled there has been selling in large volume, but against this is the fact that there are 60 per cent more factory employees out of employment than in December, 1919. Unemployment and excess stocks cannot make for good industrial conditions. Liquidatoin is a bar to stabilization, and until this shall have been completed the market will not be ripe for any increased activity in the mill.

Operating against the hope of immediate revival is the unsettled condition as to exports. Cuba, one of the best customers of the United States for low end cotton hosiery and artificial silk stockings, has been returning very large quantities, primarily due to the moratorium on the island republic and, secondarily, the congested state of affairs in each of the island's several small harbors. A lot of women's 176 needle cut toe cotton hosiery, 20 ounce, was offered at 65 cents a dozen. This of course did not establish a price, but while the goods were available manufacturers could not obtain mill value.

Misses' coarse gauge ribs, 28 ounce on size 9, have been offered at well under the cost of making, even figuring yarns on the basis of 26 cents for single carded 10s, a price at which a small quantity was bought. It was made to appear that several manufacturers had quoted 85 cents. This could not be verified, although it was authoritatively stated that a distress lot had been offered at that figure. A western jobber who had been quoted one dollar asserted he could buy at 85 cents, and he stated 75 cents was his limit.

Pending a settling of prices manufacturers would do well to give little attention to reports of spectacularly low quotations. It is easier to find the goods than a customer for them, and selling agents necessarily give first thought to the buyer. The agent gets his commission, even though the seller has suffered a loss, and the buyer a good speculative purchase. Two Pennsylvania underwear manufacturers became involved in a controversy through agents playing one against another for a price, with the result one was reported quoting 75 cents a dozen under his established price. Friendly interests stepped in and straightened the matter out by showing there had been no attempt by either to beat the price of the other.

Some selling agents have underestimated their principals' firmness in resisting the price-beating methods of speculative buyers and have had orders returned without so much as a "Thank you." One agent to whom an underpriced order was returned was advised by the mill, "You might offer this to some jobber in distress who is willing to take a loss. We want business, but are not so eager for it that we would permit the buyer to name our price, unless it let us out at least whole."

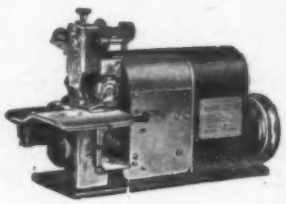
In another instance an order was offered with the written provision, "The buyer reserves the right to return the goods covered by this order if any of the garments—(underwear) shows the slightest imperfection, and it is understood that if prices decline before delivery date, seller is to allow buyer a rebate equal to the sum of such decline." The order was sent back, with the tart comment: "When you are ready to finance the business of this mill we may permit you to name terms of sale. For the present we reserve to ourselves the right to a voice in the matter."

Manufacturers have been entirely "too easy." A Baltimore merchant returned several cases of hosiery to a southern mill, who referred the matter to his organization. The latter reminded the merchant that if he persisted in throwing the merchandise back on the manufacturer the organization, in conformity with an established practice, would have to report him for canceling. The merchant promptly replied: "If I had known that the mill did not accept cancellations the goods would not have been returned. Other mills let us cancel when the market declined and we thought this one would. We have instructed the mill to reship the goods which we returned."

Cutting prices or yielding to the representations of buyers and selling agents is one thing; naming a low fair price and sticking to it is another, and the only correct policy, as has been shown. One of two mills making almost identical lines of worsted heater stockings clung to its former price pending completion of orders, and was getting no new business. The other, whose orders for near months had been shipped out made a downward revision preparatory to entering on the next selling campaign, and instantly received moderate but substantial business. "How did you come to buy 12 cases of heathers in the present market?" was asked of one jobber who had placed an order. His reply is significant. He said: "The price is

MERROWING

ESTABLISHED 1838
MAKERS OF



THE MERROW HIGH SPEED

OVERSEAMING; OVEREDGING
AND SHELL STITCH MACHINES

MERROWISE

FOR EFFICIENCY
IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.

ARE YOU PREPARED?

The Immigration Question, the Tariff Question, the Tax Question—every question with a bearing on the future of business—is going to be settled—perhaps sooner than expected.

ARE YOU PREPARED
for the flood of business that cannot be checked? Or will you be preparing while your rival is getting the cream?

THE KNITTING TRADES
expect you to be prepared with the best that American capital and genius can produce. Show it in the

KNITTING ARTS EXHIBITION

Philadelphia, May 2nd to 5th, 1921

Show that you are prepared. You will find the Knitting Manufacturers in the Exhibition —prepared. They expect to meet you there—two minds with a single purpose.

BETTER RESERVE SPACE
right away. More than 125 Exhibitors have signed contracts. Very attractive locations remain. All front on two aisles; some on three; large ones on four. Write for list of unsold spaces and make your selection. Nothing to gain by waiting; all in favor of the exhibitor who ACTS NOW. Write

C. B. CARTER, Secretary

40 South Seventh St., Philadelphia

NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS

right, and when this mill names a price for a given period it sticks to it."

A Central West manufacturer has priced mercerized half hose $3.25 and silk half hose of 12-strand $6.50, from which figures there are to be no deviations unless there be such cost changes as to warrant. Several other mills are asking only $3 for mercerized and $6 for silk. This is satisfactory to the first mill referred to, whose executive contends his stockings are worth the difference. "If buyers decide otherwise," he says, "we either will have to make a better stocking or reduce our price. We would prefer the first alternative. The point is, if all of us have named what we know to be value prices, we should adhere to them. If we don't, we will be making a confession that our original price was too high, and every time we made a reduction the buyer would assume there was another to come."

Price cutting and trying to match prices of distress merchandise will bring no such business as would start mills going. A fixed policy doggedly adhered to will set the buyer right. Prices may go lower if there be continued declines in operating cost, but smashing cuts are to be avoided. Foreign, rather than domestic, conditions, are the chief factor in uncertain values of low end hosiery, and, strive as they may to stabilize prices in the home markets, manufacturers will be confronted with a disturbing problem pending the righting of situations abroad.

New York exporting interests placed orders for wool socks aggregating 200,000 dozens, and another order, for 150,000 dozens, was available, all for Russian account. It was stipulated that 25 per cent of the value of the first order was to be paid in gold before the goods were shipped from the mill, the balance to be paid against New York shipping documents. Gold from Russia was sent to the United States, but a sub-treasurer would not let it pass to the possession of American interests. The agent of the old imperial government of Russia had notified all countries that the gold available to the soviet government had been confiscated from the imperial government, and threatened to hold them responsible in the event it could be shown confiscated gold had been permitted to come into the country. In the circumstances shipment of the hosiery could not be made with safety to sellers and the deal is off.

Some of the European orders have been cancelled, returns coming from at least one country which has boasted that its merchants are mindful of the sanctity of a contract and never breach, and several of the South American markets have been behaving badly. There has been therefore a considerable backing up of merchandise sold for foreign account, and this is figuring in the reckoning of possible prices in the domestic markets.

One result of these accumulations and the unwillingness of jobbers to operate except for the morrow has been a considerable selling by manufacturer direct to consumer. Large quantities of hosiery have been moved by mills in each of a number of cities combining in a small way for reaching the public by eliminating both jobber and retailer. In Reading, Pa., both hosiery and underwear were sold for a month preceding Christmas by a half dozen manufacturers who had pooled their issues and rented a store for their sales. Not only did they sell goods—they amazed customers with revelations as to differences between mill and retailer prices.

A Philadelphia manufacturer of sweaters advertised that he would sell direct to consumers from the mill office, and claims to have been well rewarded for going over the heads of distributors. In Brooklyn, N. Y., a large manufacturer of clothing advertised that, for the first time in thirty years selling to jobbers only, he now would sell to the wearer. Here too there was an enormous direct business, garments being sold at fully one-half the prices prevailing in retail stores.

The success of manufacturers in disposing of surplus stocks by the direct method was siezed as the cue to a plan for making cancelors the direct sufferers by the evasion of contracts and sparing losses for mills on which goods are thrown back. The idea, as elaborated on by several mill heads, is to notify a merchant that all goods due against an order which he cancels will be sold to the consumer, to be advertised as cancelled merchandise. Carrying the plan further, for obtaining a maximum of result, it is suggested that a clearing house for cancelled goods be established in each of several cities—one in a shopping center of the South; one in Philadelphia and others in New York, Chicago, St. Louis, Omaha and San Francisco. Manufacturers receiving cancellations would, under the proposed plan, ship the rejects to the clearing house, to be disposed of at mill price plus cost of selling.

Except for demoralization in foreign markets, hosiery would be in a relatively strong position in contrast with underwear, and at the worst suffered less. Underwear is to have its inning very soon, however, when buyers will be forced to make commitments for spring, whether prices do or do not seem attractive. But they will buy sparingly, for they believe retailers will not operate until along in March or April. To date purchases of spring underwear probably do not aggregate 10 per cent of requirements. Scattered mills have received small orders, and some of these are subject to price revision. The purchases mainly were for the better types.

Manufacturers of sub-standard bal briggan underwear believed earlier in the buying season—which, however, failed to materialize—that $4.50 was a fair price and would be attractive to jobbers. As long ago as September there was a feeling in some quarters that the bals might move at $3.50, and yarns, at 15 cents a pound below cost of spinning, were available at that time. But the $4.50 price was adhered to and buyers stayed out of the market, with the result that operating in other lines was deferred.

In the trade twice prewar was fixed as an arbitrary price for underwear for spring 1921. At $3.50 the bal briggans would have been on about that basis. Since then the declines in yarns and payrolls have made it apparent that it will be possible to get under twice prewar, whatever that was, and the public is looking for a visualizing of that possibility. It happens that much of that part of the public ordinarily a patron of sub-standard bals is idle, and if jobbers restrict their purchasing to the extent intimated by spokesmen for leading distributors, more will be idle in January than in December.

Jobbers assert they will be ready to operate in the last two weeks of January. Some would prefer staying out of the market until February. It is a safe guess, however, that so soon as a few of the larger houses have been detected taking care of their spring requirements there will come very keen inquiry and a stiffening all along the line. The full effect on the underwear industry will depend in great measure on the extent to which mills accumulated stock before closing down. Manufacturers believe or affect

Do you want your mill to turn out the best material with the lowest percentage of waste and seconds?

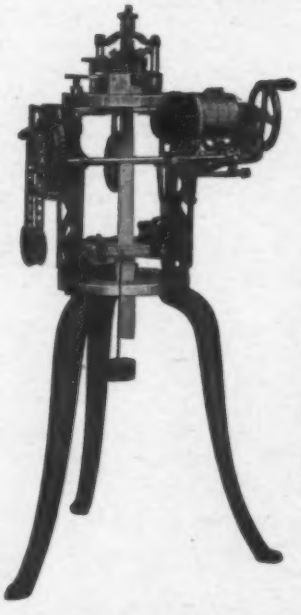
Your percentage of seconds will be lessened if you order the best Latch Needles, Transfer Points and Sinkers.

Let Me Send You Some.

Charles B. Paulus

1516 Sixty-Eighth Ave., Oak Lane, Philadelphia, Pa.

H. BRINTON CO.



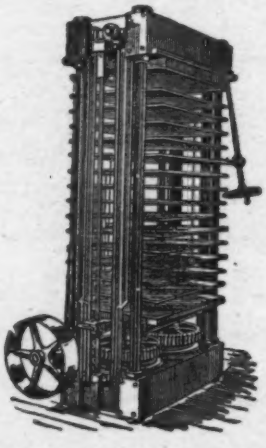
Builders of
Circular Knitting Machinery
of every kind for every purpose

Hosiery Ribbers
with the very latest attachments

Full Automatic Hosiery Footers

Body Machines
Sleevers, Etc.
for Underwear, Sweaters, Toques, etc.

Write for Catalog, Prices and Samples
213-217 Race Street, PHILADELPHIA, PA.
Canadian Agent: Hartley Kay, Ltd., Georgetown, Ont.



RELIANCE
Hot Plate Screw Press
FOR
Hosiery and Underwear
Write for Catalog and Prices
Reliance Machine Works
FRANKFORD, PHILA.

to believe that all the light underwear in stock will not be sufficient to take care of the initial orders of the buyers first to get into action. Jobbers, as a matter of expediency, necessarily, express a contrary view.

Manufacturers have shown no disposition to prepare for a rush, the tendency being to make no commitments for supplies until business is assured. In other words, there will be considerable short selling, notwithstanding a six months' business must be crowded into less than three months.

A few jobbers, by way of sounding out manufacturers, have intimated they will expect long dating and guarantee of prices against sellers' declines. The outlook is for a short snappy season, with distributors seeking every advantage and some manufacturers yielding. It is within the power of manufacturers to start the next market right—guarantee no prices and make provision for absolute protection against cancellations. As has been advanced in antagonism to the guaranteeing of prices, this is a species of one-sided protection that cannot be extended to the cotton grower and is not available to the consumer. Spinners do not permit cancellation of yarn contracts, and in sequence manufacturers should not. If they did not, jobbers would have to shoulder the responsibility for trading with the retail trade on the cancellation price-guarantee basis and there would come an end to it.

There will be little reason for canceling spring underwear contracts. The merchandise will reach jobbers so late that they will make sure when ordering that delivery is to be made within a specified time limit, and price demoralization will be the ruling factor only if cancellations are offered. Firmness as to prices and terms is an essential in making the next market a reasonably safe one. In support of this proposal is the experience of manufacturer and jobber in relation to heavy weight underwear for the current retail selling season. There has been heavy liquidation, with demoralizing result for manufacturer and retailer.

Sixteen-pound cotton union suits for which one jobber paid early in the year $17 a dozen were sold by him at $12, a price at which it is held the garments could not be produced on present operating cost. Other jobbers are understood to have parted with the unions at like sacrificial figures, and 11-pound shirts and drawers were sold down by wholesalers at as low as $7 a dozen.

A backward winter and the trend toward liquidation were responsible largely for the low prices at which late retail buyers were enabled to acquire heavy weight underwear. Jobbers were taking their losses on this year's inventories. Thus they have put an artificial value on goods carried over from 1920 into 1921. They cannot consistently mark such goods up, for to do so would be regarded as indicating the low values of 1920 were named only for the purpose of reducing 1921 excess profits tax payments. To be consistent, these holders would have to offer underwear, if any great quantity be carried over, at or about the prices shown in the inventories. Among manufacturers there is the question, can the goods be produced at such figures as have been named?

By December jobbers should have been buying for the fall and winter of 1921-22. There has been no intimation as to when the lines will be opened, but in the trade it is assumed jobbers will not be interested before March, or in any event not until something definite as to stability of spring lines has been shown.

Some of the sweater manufacturers planned early in December to show samples during the first week in January, and by the end of the month it will have been ascertained to what extent 1921 prices appeal to the trade. As an intimation of probable values, several lines of woolen and worsted sweaters have been priced 33⅓ per cent down from the opening of one year ago.

A gain of 127,003 dozens of cotton hosiery exported in October as in comparison with September is shown, the October exports amounting to 824,393 dozens, valued at $2,814,114. The heavier shipments by countries were 194,949 dozens to Australia and 101,687 dozens to Cuba. Other destinations for more than 10,000 dozens were: France, 21,310; Italy, 15,550; Netherlands, 14,773; England, 82,624; Canada, 21,858; Mexico, 11,950; Argentina, 41,000; Chile, 50,050; Colombia, 13,010; Peru, 20,359; Uruguay, 18,152; Venezuela, 18,250; British India, 15,007; New Zealand, 13,761; Philippine Islands, 20,839; British South Africa, 15,232.

For the ten months to October the exports of cotton hosiery were 10,240,118 dozens, of a value of $33,358,154, this in contrast with 9,477,374 dozens in the twelve months of 1919, valued at $26,283,565.

Exports of artificial silk hosiery in October totaled 68,989 dozens, valued $562,409, bringing the quantity for the ten months of 1920 to 693,390 dozens, of a value of $6,043,735. The artificial hosiery exports to October this year are 900,000 dozens under those for 1919. Countries taking 2000 dozens and more in October were: Italy, 2550; England, 18,325; Cuba, 3574; Argentina, 9147; Chile, 3878; Uruguay, 3310; Asia, 13,264; French Africa, 2054.

The Kaumagraph Company announces the opening of a new office at 79 James Street South, Hamilton, Ontario, Canada. This will be in charge of Paul C. Fish, a Canadian, who will take care of customers located in the Dominion of Canada. It will be remembered that only a short while ago this company opened new offices in Boston and Chicago.

The Southern Brush and Broom Company, Atlanta, Ga., have a plant located at Fairburn, Ga., where they manufacture "Easy" floor and scrub brushes known as "2-in-1." They have the largest plant in the South devoted exclusively to the manufacture of brushes and brooms, they claim, and have a floor space of approximately 40,000 square feet. They sell floor brushes with removable tops and also with a bottom made of coarse bristle for scrubbing the floor and another bottom of fine fiber for sweeping purposes. These are interchangeable, if necessary, and all that is necessary when ordering new brushes is to buy the bottom part of the brush, as the top is detachable and can be used indefinitely.

Belmont Iron Works, Philadelphia, are sending out their usual calendar to their friends and customers. In this year's calendar the convenient "three-months" plan has been retained, and interesting views of some of the construction work of the company are shown on the different sheets.

JOHN D. LEWIS

Manufacturer of

Logwood, Cutch, and Other Dyewood Extracts

TANNIC ACID

Main Office
1209 Turk's Head Bldg.

PROVIDENCE, R. I.

Works
Charles & Bark Sts.

BRANCH OFFICE:

NEW YORK, N. Y.
2-4-6 Cliff St.

PHILADELPHIA, PA.
583 Drexel Bldg.

BOSTON, MASS.
Old South Bldg.

E. S. DRAPER

CHARLOTTE, NORTH CAROLINA

LANDSCAPE ARCHITECT AND CITY PLANNER

PREPARATION OF ILLUSTRATED REPORTS EMBODYING SUGGESTIONS FOR GENERAL MILL VILLAGE IMPROVEMENT AND IMPROVEMENT PROGRAMS TO GOVERN ANNUAL BUDGETS.

MILL VILLAGE DEVELOPMENT

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks. Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 35c or $3.50 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

99 Beekman Street NEW YORK

The Walke Box Company, Inc.

NORFOLK, VA.

Manufacturers of

NORTH CAROLINA PINE BOX SHOOKS

WILLIAM ISELIN & CO.

COMMISSION MERCHANTS
—COTTON GOODS DEPARTMENT—
18 and 20 Thomas Street
NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

AUGUSTA MILL SUPPLY CO.

Textile Machinery

General Mill Supplies

Transmission and Power Apparatus

429 JACKSON ST. AUGUSTA, GA.

COTTON—WOOL—SILK DYED or BLEACHED in SKEIN

Fast to Bleaching. Delivered in Skein or Tube.

PROMPT DELIVERIES—RIGHT PRICE

Backed by 18 Years Experience.

Same yardage delivered as received. COUNT YOUR SKEINS.

Your Patronage Solicited.

HABERSHAM KING, JR.

Plant: 4-6 North Butler St., Atlanta, Ga.

CONNECTIONS AND SERVICE, 37 PRINCIPAL CITIES

Walter Gregory & Gregory

ACCOUNTANTS—AUDITORS

214 Atlanta National Bank Bldg. Atlanta, Ga.

Special Income Tax Service—Washington, D. C.

Practice Limited to Auditing and Federal Income and Excess Profit Tax Review and Preparation.

The Yarn Market

Inventories in the various New England mills and among the textile trade generally have been pretty well completed, many concerns writing off their losses and preparing to launch their business campaign for the new year on the readjusted basis of low prices. With each passing day the conviction becomes stronger that the yarn consumers will resume business more readily with the less expensive counts in preference to the finer numbers. It is now felt that a cautious policy in ordering and a concerted effort to eliminate all semblance of profiteering from producer to consumer will go further towards regaining confidence of the public than most of the other factors influencing the situation. The few inquiries received are now mostly for warp twist weaving yarns and the least expensive numbers of other varieties. The fine combed peeler such as 40 two ply, which sold a year ago at $2.75 a pound and could hardly be supplied fast enough to satisfy the demand, is now unnoticed at 60 to 70 cents a pound. Yet the trade sees a more prosperous year ahead with all prices on a saner basis than when 1919 began with everything advancing.

Meantime, however, cotton yarn prices in the Boston market continue to seek a lower basis and some of the sacrifice lots thrown on the market sell at startling figures. Southern combed yarn has been reported available in recent weeks at 10 to 25 per cent under Eastern spinners' figures. The latter have attempted to reduce this margin, aided by the cut of 22½ per cent in wages of operatives throughout New England and New York textile mills. But the bulk of the inquiries continue to be for southern yarns.

The wage reduction is objected to by organized labor as a matter of course, although it must be admitted that the statements emanating from labor leaders are strong enough to indicate serious opposition. Individual opinion however seems to favor the lower rates on the theory that they will bring more steady employment so that the total weekly earnings for the operative will be larger than under present two or three day operating weeks at the higher wage. Fall River manufacturers, who announced that wages would not be cut, are reconsidering the question and many meetings have been held on the subject. It is expected that they will follow the other textile centers. Barring Fall River the number of employees affected by wage reductions is upwards of 100,000. At present the mills lack orders, however, and are curtailing even further than previously.

The American section of the cotton trade of Manchester district of England, which constitutes three-fourths of the whole industry there, has decided by ballot to reduce the weekly working hours from 48 to 24.

Credit restriction prevents considerable speculation in yarns that would undoubtedly occur with prices at present low levels if money was more plentiful. Indeed some consumers have expressed sufficient satisfaction with present quotations to warrant them admitting a willingness to speculate if they had access to the necessary funds. There are no present indications of relief along the credit lines however, and the four Boston trust companies, closed by order of the Massachusetts Bank Commissioner, are not expected to be "straightened out" before April 1. Furthermore, the payment of the final installment on the 1919 excess profit taxes, due Dec. 15, could not be postponed and the greatest difficulty was experienced by many textile interests in meeting the obligation. Some were reported to have been obliged to ignore the bill in hopes of better business before legal action could be taken. The truth of the latter assertion remains to be seen. A bill is now before Congress looking towards February 15 as the final date for payment on 1919 taxes.

Efforts to prevent repetition of the wide spread cancellation practice of the spring and summer have not abated. Cotton yarn brokers, dealers and others who formed the Yarn Dealers' Association with that object in view, have received their certificate of incorporation. Officers are all New York and Brooklyn men. Objects of the association include: handling of industrial disputes between members and customers; cooperation of members in the management of all bankruptcy matters in which they are interested; adjustment of complaints regarding unwarranted returns and cancellations of orders and the establishment of trade regulations.

Yarn dealers, brokers and spinners as well as manufacturers of cotton goods are intensely interested in the retail situation where prices to the ultimate consumer are held above levels that are considered possible with business suffering from its present depression. Hundreds of employees were dismissed by the Boston department stores prior to the Christmas holidays and no customary appeals for extra clerks have been noted in the daily want ad columns, despite the efforts of retailers to convince the public that "buying is good" and "conditions are satisfactory." Indeed some of the better known merchants have announced publicly that business is the best in the history of their stores, yet the number of applicants for jobs increases daily and a close watch of the sales counters does not reveal the customary heavy buying of the season.

Current prices of representative numbers used in New England with comparisons a year ago follow:

SOUTHERN SINGLE CARDED CONES

Grades	Current Prices	Year Ago.
10s	30	68@ 69
12s	30	69@ 70
14s	31	70@ 71
16s	31	72@ 73
18s	31½	73@ 74
20s	32	74@ 75
22s	32½	76@ 77
24s	33	78@ 80
30s	35	85@ 88
40s	47	1.30@1.35

WEAVING YARNS—WARP TWIST

10-2	29@30	70@ 72
12-2	30@31	72@ 74
14-2	32	74@ 75
16-2	33	75@ 77
20-2	33@34	90
24-2	35@36	95@ 97
30-2	40	$1.05@1.10
36-2	45	1.25@1.30
40-2	48	1.40@1.50

NORTHERN CARDED

10-1	34	72
16-1	37	75@ 76
20-1	40	77@ 78
26-1	42	82@ 84
30-1	43	90@ 92
40-1	52	$1.20@1.25

NORTHERN COMBED

10-1	53	$1.10@1.12
16-1	54	1.14@1.15
18-1	57	1.17
20-1	58	1.19
26-1	62	1.25
30-1	74	1.39@1.40
36-1	80	1.50
40-1	87	1.65@1.70

DOBBINS SOAP MFG. CO.

PHILADELPHIA

For over half a century makers of high grade Soaps and Scouring Materials for Textile Manufacturers

AMERICAN TEXTILE BANDING CO.

(INCORPORATED)

MANUFACTURERS OF

AMTEX

Spinning and Twisting Tapes---Double Loop Bands
Heavy Cotton Webbing for Light Belting and Harness
Leader Tapes for Bleacheries

PHILADELPHIA, PA.

Main Office and Mill:
Belfield Ave. and Wister St., Germantown

Treasurer's Office:
23 South Second Street

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY
HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE---RIGHT PRICES
1815 E. Boston Avenue, Philadelphia

SOAPALITE

SAVES
SOAP

Full particulars on inquiry of
The Electric Smelting & Aluminum Co.
Lockport, N. Y.

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C"

There was an evident improvement of a more or less important degree in the tone of the Philadelphia cotton yarn market for December. It seemed that the market was on its way "out of the woods." At least that's the way it appeared to experienced factors, who, even in the face of some prices that still crumbled, believe that this market has most probably seen its worst, and that business for the new year will be planned on a higher basis—for all concerned—than has been the case since the process of deflation took hold.

Early in October, because of price shrinkage which had already occurred, and facing further reduction that was inevitable, this market as a whole was certainly a "gloomy" crowd, prepared to see itself and its customers go "broke." All hands sat tight in the boat, however, in the hope that the profits made in the upward rush of prices would be sufficient to offset, either wholly or in part, the losses resulting from the "slump."

It appears that this faith in the "odd chance" was generally justified. The big profits have, for the most part, disappeared in the liquidation of debts, and many on both ends of the market are about in a position similar, financially, to that experienced along about 1914, but nevertheless the feeling is that there is now to be a much more apparent resistance to price weakening.

Only a few minor price changes were reported in the first week. These were mostly scattered through counts of single carded cones. The yarn turn-over was less—the smallest of the year in some opinions—but the Thanksgiving holiday coming in this week had a diminishing effect on the volume of business.

Inquiry developed a somewhat broader trend in the second week. Furthermore, a larger number of spinners were, during this period, making the rounds of the yarn district getting first-hand information on market conditions. Some sales were made at slightly increased figures. These included 100,000 pounds of 8s three-ply warp at 30 cents, whereas the general quotation had been 28 cents. And 50,000 pounds of 30s single carded cones were sold at 40 cents as compared with a previous sale price of 37½ cents. Southern carded yarns weakened during the week, but this was attributed to somewhat heavier offerings.

The third week brought some few reports of lower rates for certain counts, but these covered sales governed by special conditions. There was a perceptable increase in inquiry and the feeling of greater confidence among both buyers and sellers became still more apparent. The week disclosed two important changes in sentiment, namely, that distributors were willing to urge their accounts to buy moderately at prevailing prices, and that some distributors who had been holding merely a trading position in the market were known to be buying for themselves.

Cotton yarns gave a steadier appearance the fourth week. The government cotton crop report seemed to have a bearish effect on the cotton yarn market, but factors were optimistic regarding the future demand for yarns. Some inquiry was received in this market for knitting yarns for spring 1921 delivery, some as late as April and May, but the majority preferred to wait and not obligate themselves so far into the future, under the prevailing conditions. Weavers showed a little interest and continued to buy in small quantities. Combed yarns received only scattered inquiry.

Recent Philadelphia quotations follow:

Southern Single Skeins.

4s to 8s	.26	10s	.26½
12s	.27	14s	.28
16s	.29	20s	.30
24s	.32	26s	.34
30s	.40		

Southern Single Warps.

8s	.26	10s	.27½
12s	.28	14s	.29
16s	.29	20s	.30
26s	.34	30s	.38
40s	.45		

Carded and Upholstery Yarns in Skeins.

8-3-4 slack	26
9-1-4 slack	26
8-3-4 tinged tubes	22
8-3-4 hard white warp twist	27
8-3-4 hard twist waste	20

Southern Two-Ply Skeins.

8s	.26	10s	.26½
12s	.27	14s	.28
16s	.29	20s	.30
24s	.32	26s	.34
30s	.45	40s	.45

Southern Two-Ply Warps.

8s	.27	10s	.27½
12s	.28	14s	.29
16s	.29½	20s	.30
24s	.32	26s	.34
30s	.38	40s	.45

Southern Two-Ply Combed Peeler Skeins and Warps.

20s	.55	24s	.57
30s	.60	40s	.65
50s	.70	60s	.80
70s	.90	80s	$1.10

Southern Frame Spun Carded Yarn on Cones.

8s	.27	10s	.28
12s	.28	14s	.29
16s	.29	18s	.29½
20s	.30	22s	.31
24s	.32	26s	.32½
30s	.34	40s	.45
30s tying-in			32
30s double carded			36

Northern Mule Spun Carded Yarn Cones.

10s	.33	12s	.34
14s	.35	16s	.36
18s	.37	20s	.38
24s	.40	26s	.41
30s	.42	40s	.50

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	.54	12s	.55
14s	.56	16s	.57
18s	.59	20s	.60
22s	.61	26s	.65
28s	.67	30s	.69
36s	.75	38s	.77
40s	.80		

Mill Construction.

(*Continued from page* 192.)

Union-Buffalo Mills, Buffalo, S. C.—New cottages and welfare building. Total floor space 4,500 square feet.

Watts Mills, Laurens, S. C.—New opener room and machinery changes. Total floor space 2,500 square feet.

Excelsior Knitting Mill, Bryson City, N. C.—New mill. Total floor space 5,500 square feet.

Grey & Whitehouse, Bristol, Va.—Knitting mill. Total floor space 11,500 square feet.

Lancaster Cotton Mills, Lancaster, S. C.—Addition to steam plant.

Consolidated Textile Corporation, Ella Division, Shelby, N. C.—Water and sewer system.

Revolution Cotton Mills, Greensboro, N. C.—Extension to power plant. Total floor space 5,400 square feet.

Smith & Furbush Machine Co., Philadelphia, is sending out its usual calendar to its friends and customers, showing reproductions of the felting, shoddy and waste machinery made by this company.

General Electric Co., Schenectady, N. Y., is sending out to its friends and clients an attractive calendar on which are shown reproductions of some of the products and installations of this organization.

Among the Knitting Mills

The Hercules Knitting Co., 1097 Greenbush Street, Milwaukee, Wis., has awarded a building contract for the construction of a new one-story addition to its plant, 30 x 80 feet, and estimated to cost approximately $45,000.

The Hub Knitting Mills, Inc., 1007 Buchmann Avenue, Ridgewood, Long Island, N. Y., is receiving bids for extensions and alterations to its four-story brick factory for increased capacity. The proposed work is estimated to cost about $50,000. L. Berger & Co., 1696 Myrtle Avenue, is architect.

The Blood Knitting Co., Amsterdam, N. Y., has completed plans for the rebuilding of the portion of its plant recently destroyed by fire, comprising a new dyehouse and other works departments. It is proposed to inaugurate construction at once.

The Universal Knit Goods Co., New York, N. Y., manufacturer of sweaters and kindred specialties, has leased quarters at 299 Broadway, for a new local establishment.

The Northern Knitting Corporation, Utica, N. Y., has been incorporated with a capital of $100,000, to manufacture knit goods, including sweaters, bathing suits, etc. The incorporators are A. L. Evans, J. D. Judson, and J. F. Hubb, all of Utica.

The Bedford Co., Boston, Mass., has been incorporated with a capital of $50,000, to manufacture knit goods specialties, by A. and M. Cohen and Edward J. Murray, Dorchester, Mass.

The Lesher-Raig & Story Knitting Co., Ltd., Reamstown, Pa., manufacturer of children's cotton underwear, has resumed operations at its Ephrata branch plant. Curtailment of work at this mill was due to lack of orders.

The Utica Knitting Co., Utica, N. Y., has work under way on its new three-story, 90 x 130 feet, power house at 1712 North Erie Street. The structure is estimated to cost about $25,000.

The Clifton Knitting Mills, Brooklyn, N. Y., manufacturer of boys' and men's sweaters, and kindred specialties, recently incorporated with a capital of $50,000, and operating local plant at 134 Stanhope Street, is in the market for knitting needles. Mitchell Wolsy is president.

The Rockland Webbing Co., Rockland, Mass., manufacturer of cotton goods specialties, is contemplating the erection of a two-story, brick and reinforced concrete addition to its local plant, estimated to cost about $60,000.

The Turner Textile Co., Wilmington, Del., has been incorporated with a capital of $100,000, by M. E. and F. L. Mettler and P. M. Gilkey, Wilmington, to manufacture cotton products.

The Addison Hosiery Corporation has filed notice of dissolution under New York State laws. The company has been operating at Buffalo, N. Y.

The Hope Webbing Co., Main Street, Pawtucket, R. I., will hold in abeyance plans for the erection of additions to its plant. The proposed structures will be five story, 80 x 190 feet and one-story, 20 x 26 feet, respectively, and estimated to cost about $300,000.

The Berkeley Knitting Mills, Inc., Brooklyn, N. Y., has been incorporated with a capital of $50,000 to manufacture knit goods. The incorporators are S. and F. Kaplan and G. F. Mattuck, 135 Broadway, New York.

The Justicia Knitting Mills, Brooklyn, N. Y., has been incorporated with a capital of $10,000, by Jacob Lehrman, 274 Floyd Street, Henrietta Samt and George W. Averell, to manufacture knit specialties.

The Superior Manufacturing Co., Hoosick Falls, N. Y., manufacturer of knit goods, has filed notice of increase in capital from $200,000 to $500,000.

The Wessell Knitting Co., Johnston, N. Y., manufacturer of knit specialties, has filed notice of change of name to the Scotsmoor Company.

The Phoenix Underwear Co., Little Falls, N. Y., is considering plans for the erection of an addition to its plant. Carl Haug & Sons, 547 Main Street, are architects.

The Oak Knitting Co., Syracuse, N. Y., operating plants at Syracuse and Arcade, N. Y., as well as Ypsilante, Mich., is preparing plans for the erection of a new four-story, brick, 40 x 50 feet addition to its plant at Syracuse, estimated to cost approximately $20,000.

Fire, Nov. 19, damaged a portion of the stock and machinery of the Alabama Knitting Mills, Brooklyn, N. Y., manufacturer of sweaters, etc. The loss has not yet been estimated.

The Peerless Knitting Mills, Inc., has been incorporated with a capital of $25,000, to operate at Newark, N. J., for the manufacture of cotton goods, etc. The incorporators are Karl H. Tagnazian, George and A. Artinan, 20 Clinton Street, Newark.

The Clarion Knitting Mills Co., Brooklyn, N. Y., has been incorporated with a capital of $10,000, by J. O. Rosenblum, 546 Willoughby Avenue, Pauline Roat and M. Murray Simon, to manufacture sweaters and knitted novelties.

The Corrigan Knitting Co., Utica, N. Y., has been incorporated with a capital of $15,000, by James P. Corrigan, Leslie J. Mabbett and Lawrence J. Zimmer, to manufacture knit goods novelties.

The Lillian Knitting Mills, which have been operating a branch plant with 100 machines at Badin, N. C., have discontinued that plant and moved the machines to Albemarle, N. C.

It is reported that the P. H. Hanes Knitting Company, Winston-Salem, N. C., is to build another addition to its business which promises still further expansion of its plant, and in time a development that will practically double its present output. It is also announced that this company had added to its lines the production of high-grade nainsook athletic union suits, the manufacture of this type of garment having already gotten under way.

Three additions to the board of directors of the American Textiles, Inc., Bay City, Mich., were made at a recent meeting of the stockholders, and the directors subsequently elected the following officers: President, D. L. Galbraith, formerly secretary and treasurer; vice-president, M. H. Smith; secretary, Henry B. Smith; treasurer, Howard F. Smith; general superintendent, C. A. Galbraith. The remaining directors are E. Galbraith, E. H. Smith and Archibald Galbraith. The American Textiles, Inc., operates mills in Bay City and Mount Vernon, Ill., making underwear and hosiery, and sells only to jobbers. The company maintains an office in the Albemarle Building, New York, in charge of J. Guyon Clark.

Liquid EBG Chlorine

The Only 100% Efficient Bleaching Agent

WHY waste time and money preparing your own bleaching solutions from lime?

WHY run the risk of yellowing and tendering your goods?

WHY pay excessive freight charges?

The most simple process of bleaching,—the bleach that contains 100 per cent available chlorine—the bleach that diminishes the harshness in your goods and increases the tensile strength is E. B. G. Liquid Chlorine.

READ WHAT THESE WIDE-AWAKE MILL MEN SAY ABOUT IT!

"We have thoroughly tested out your Liquid Chlorine on a practical scale and find that it is very satisfactory. We anticipate that it will not only give us a considerable saving in the price of our bleaching, but it also gives us a better white than our old method with bleaching powder, and finally the bleached goods give much better results in the dye bath."

April 15, 1919. CHENEY BROTHERS, South Manchester, Conn.

We would be pleased to send full particulars on request.

ELECTRO BLEACHING GAS CO.

Pioneers and Leading Manufacturers of Liquid Chlorine

PLANT: NIAGARA FALLS, N. Y.

Main Office: 18 East 41st St., New York Chicago Office: 11 So. LaSalle St.

CORTRIGHT METAL SHINGLES

Protection to your buildings from flying embers, sparks, wind and rain—

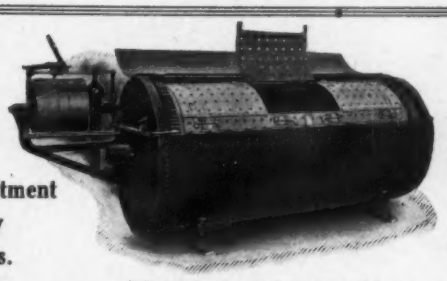
A Cortright Metal Shingle Roof.

They are laid right over the old roof if you want. And it is a fact that Cortright Metal Shingles often last for 30 years.

Ask your roofer or builder about them or write us. We'll send our book, Concerning That Roof.

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

100 Pounds Each Compartment Capacity 1200 Lbs. Per Day.



Other sizes, also steel storage tanks built to order.

IMPROVED STEEL ROTARY DYEING MACHINE

Manufactured by

ROME MACHINE & FOUNDRY CO. - ROME, GA.

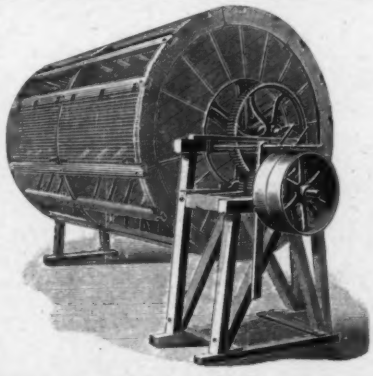
Write for Prices

DYE HOUSE MACHINERY

Oxidizers are built with spur gear and also with worm gear drive. Also makers of Dye Machines, Oxidizers, Tom-Toms, and dye house machinery, to specifications.

Write us.

SALEM IRON WORKS, Winston-Salem, N. C.



LOWELL CRAYONS

Made in 15 different colors and white.

Used by all first-class textile mills, because they are worth their cost. The constituents are such that produce desirable results. Do not leave stains.

LOWELL CRAYON CO.
Lowell, Mass.
Trade Mark on Every Box.

"Salability" depends upon the impression your products make upon the ultimate consumer—and She insists that her pretty things show the perfection which proper dyeing assures.

For dainty Tints that are fast and uniform

For the dyeing of dainty tints that are fast and uniform, for exacting work of every description, there's a world of satisfaction in the simplified efficiency of the American Dyeing Machine.

It operates with a thoroughness and speed and with a degree of certainty which were believed impossible not long ago.

Because of its triple division by "Y"-shaped partitions, the necessary "squeeze" is secured without sharp dropping or tumbling to roughen the fabric.

Every thread is repeatedly immersed in the dyeing liquor, which is gently forced through and through the fibre.

This uniform treatment assures a color that's solid, thoroughly set and free from streaks and blotches.

And, at the same time, it insures positive results with a minimum of dye and a great saving of time.

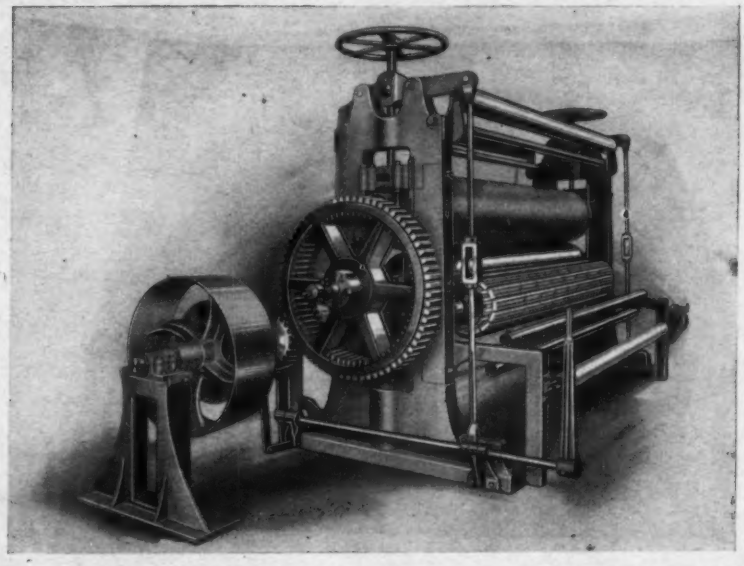
At this moment, when production costs must be watched so closely, you'll find the New American Dyeing Machine a friend in need.

Write today for details of our complete line of wooden and metal dyeing machines, including the new all-monel-metal machine which has caused so much favorable comment.

The American Laundry Machinery Co.

Specialty Department C, Cincinnati, Ohio

The American Rotary Dyer is divided by a "Y"-shaped partition into three small chambers. It handles the most delicate of fabrics without roughening, yet insures, thorough, uniform saturation.



Calender (Three Rolls)

WE like to work on those unusual problems. If you have one, let our staff of engineers and designers co-operate with you in finding the solution.

Our catalog will be sent on request.

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

PROVIDENCE OFFICE
Turk's Head Building

Canadian Representative
W. J. WESTAWAY COMPANY
Hamilton, Ontario, Canada

FINISHING
Butterworth
MACHINERY

Bleaching Machines
Drying Machines
Singeing Machines
Mercerizing Ranges
Hydraulic Presses
Dyeing Machines

Soaping Machines
Tentering Machines
Mangles (all kinds)
Calenders (all kinds)
Color Kettles
Cell Dryers

"We Sure Are Saving Soaps, Dyes & Chemicals"

Since we installed that "DECALSO" Zero Water Softener we've cut our consumption of soaps, alkali and dyestuffs at least a third and perhaps a half, not to speak of less redyeing, less spoilage, less labor and a more uniform, higher grade product.

"DECALSO" Water Softeners are paying big dividends in many mills. It has proved itself the most efficient and dependable apparatus for producing absolutely pure, soft water quickly, continually and economically.

For whatever the purpose you need soft water, there's a "DECALSO" Apparatus to meet your requirements better than anything else. Our experts are at your service, and will gladly solve your water problems without obligation. Write today for booklet.

American Water Softener Co.

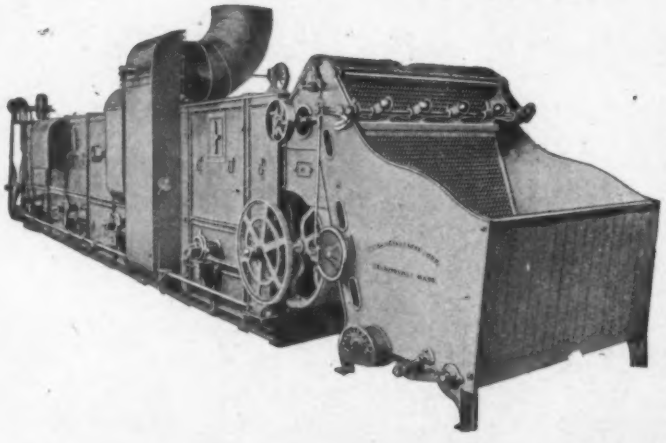
The Oldest Water Softener Manufacturers in America

Lehigh Ave. at Fourth St.
Philadelphia, Pa.

REG. U. S. PATENT OFFICE

DECALSO

The Last Word in Dryer Efficiency



Sargent Dryers mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor. They contain the latest and most up-to-date improvements.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.

In the Sargent Dryer these principles have been combined and refined, making a complete machine which is unexcelled.

For drying cotton, linters, wool, hair, flax and other classes of raw material. Let us tell you more about the superior features of the SARGENT DRYER. Write today for catalog.

C. G. SARGENT'S SONS CORP.,
Graniteville, Mass.
FRED H. WHITE, Southern Agent,
Charlotte, N. C.

SARGENT DRYERS

Rapid Production

and large output are the normal conditions which are obtained wherever

TOLHURST EXTRACTORS

are employed. The speedy and extensive production characterizing the large Textile Plants throughout the country is, in almost every instance, due, in a large degree, to the constant and increasing employment of **Tolhurst Extractors.**

We construct Extractors for all purposes.

TOLHURST MACHINE WORKS

Established 1852. **Troy, N. Y.**

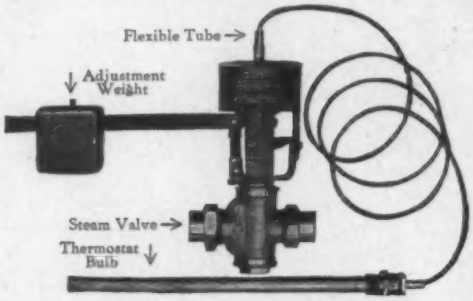
New York Office: 111 Broadway

Southern Rep.,
Fred H. White,
Realty Bldg.,
Charlotte, N. C.

Western Rep.,
John S. Gage,
Hartford Bldg.,
Chicago, Ill.

San Francisco Rep.,
B. M. Pilhashy,
Merchants Exchange Bldg.,
San Francisco, Cal.

Canadian Rep.,
W. J. Westaway Co.,
Main & McNab Sts.,
Hamilton, Ont.
400 McGill Bldg., Montreal.



The Powers Regulator No. 11.

The Powers No. 11 Regulator controls your sizing, dyeing, and starching operations with greatest efficiency and least expense. Automatically maintains the proper working temperatures. No danger of overheating because the No. 11 is very responsive to the slightest change of temperature and thoroughly regulates regardless of variation in initial pressure. Installed on a "make good" basis—or no charge.

Too Hot—Too Cold

A man's eye watching the thermometer. A man's hand turning the valves. He does his absolute best, but you know that his results are not uniformly right—because at some point there was too much or too little heat.

Automatic Heat Control Stops That

At best, a man can only use his **judgment** of temperature, which varies from one minute to the next.

Powers Heat Regulators

Eliminate the guesswork by applying the Powers Automatic Heat Regulators. They are scientifically constructed; made to operate according to certain known physical laws. We manufacture a great variety of types suited to practically *any* heat regulation condition.

Consult us at once. Our long experience enables us to give you definite information and intelligent advice.

THE POWERS REGULATOR CO.

Specialists in Automatic Heat Control.

NEW YORK CHICAGO BOSTON TORONTO

Southern Representatives **"ASKUS"** Guy L. Morrison, Charlotte, N. C.
Ira S. Griffin, Greenville, S. C.

(1154)

COCKER HOSIERY DYEING MACHINE

THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

The Spiders carrying these containers are revolved in the vat *in one direction.*

Machines are furnished with either belt or motor drive.

Points of Advantage in This Machine That Must Be Considered

1st—Matting and chafing of the stock is entirely eliminated.

2nd—Percentage of re-dyes is reduced to a minimum.

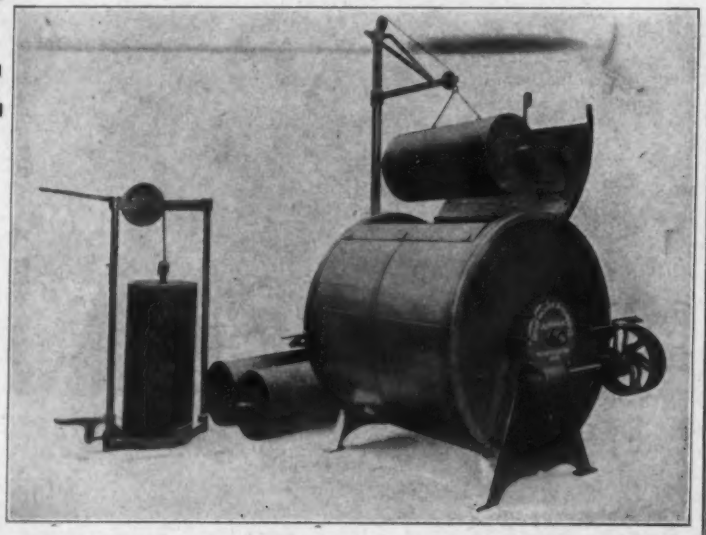
3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.



Cocker Machine & Foundry Co.

GASTONIA, N. C.

Builders of Textile Machinery.
Warpers—Beamers—Balling Attachments—Wrap Dyeing Machinery—Reels

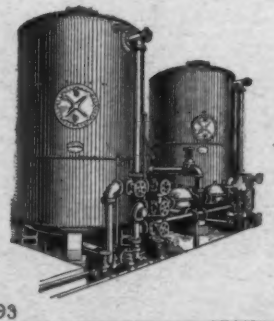
The Quality Marks of Soft Water are always in Evidence

for only soft water can insure a fundamentally clean fibre, completely free from impurities and sticky soap curds.

Soft water imparts to all fabrics a soft, clean, fluffiness that is instantly recognizable as a distinction of highest quality, and at the same time it saves labor and supplies that are otherwise wasted.

An investment in Permutit Equipment not only guarantees a dependable supply of clean, zerowater free from all hardness, but insures steady dividends in savings of supplies and progressive gains in the quality and selling value of your output.

Hundreds of mills will testify to these facts. It costs nothing to investigate. Permit us to analyze a sample of your water supply and make an estimate of your needs. No charge or obligation. Write today.



The Permutit Company
440 Fourth Ave. New York
Offices in all principal cities

93

"HURRICANE" AUTOMATIC LOOP DRYERS

Automatic Looping and Drying Machine for Underwear, Toweling, Cloth, etc.

For any fabric which can be hung up during the drying, this system is an ideal method. It offers a perfect, natural, tensionless system of drying at moderate temperatures, which closely approaches nature's own way of drying. In addition, it makes possible a shortening of the drying time and savings in the labor of handling the material, not possible by any other means.

The cost of drying is reduced because of low power and steam required.

For tubular knit fabrics our patented opening and spreading device eliminates the twist and opens out the cloth so that it is delivered from the machine smooth and with the wale straight.

For shrinking cloth this system is unsurpassed, as it gives maximum shrinkage in the shortest possible time, and at the same time preserves the quality of the cloth.

Write for Illustrated Catalogs.

A "Hurricane" Dryer for Every Material.

The Philadelphia Drying Machinery Company

Southern Representative
G. G. Slaughter Machinery Company
Greenville, S. C.

Stokley Street above Westmoreland
Philadelphia, Pa.

Boston Office
53 State Street

We take pleasure in announcing the appointment of

Colonel THOMAS B. WHITTED

Realty Building, Charlotte, N. C.

as representative in Southern States for the sale of the

Centrifugal Extractors

Manufactured by

FLETCHER WORKS

Formerly SCHAUM & UHLINGER

Glenwood Avenue and Second Street

PHILADELPHIA, U. S. A.

DURABLE K-W UNIVERSALLY USED

A Mark That Means Intrinsic Value

The hundreds and thousands of Klauder-Weldon machines now in use have, by their accomplishments, steadily and irresistibly built up a reputation that has made "K-W" synonymous with the "world's best Dyeing, Bleaching and Scouring Machinery.

What better proof of the superiority of any machine than the word of many users.

KLAUDER-WELDON DYEING BLEACHING SCOURING MACHINERY

The leading mills use them because they can buy no better at any price—the smaller mills use them because they are the most economical in ultimate cost.

You take no risk when you buy a K-W Machine. Our years of experience and the efficiency of our methods of manufacture guarantee that every machine will "stand up" under the most exacting demands. Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W literature.

The Klauder-Weldon Dyeing Machine Co.

Jenkintown, Pa., U. S. A.

H. G. Mayer, Southern Agent, Realty Bldg., Charlotte, N. C.

BORROMITED WATER— A Wonder Worker in Textile Mills

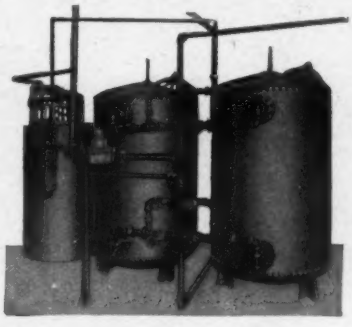
In the scouring, bleaching and dyeing departments —or wherever water comes in contact with fabric, in any process, the advantages of

PURE SOFT WATER

are tremendous. Not only in saving soap, soda and labor, but in producing a product free from lists, streaks, spots, or other similar defects.

IN THE BOILER ROOM

Borromite water cuts fuel costs tremedously, and reduces cleaning and repair expense to the minimum.



Let our engineers go over your plant and tell you exactly what a Borromite Water Softening System of the proper size will cost, and what we will guarantee it to do.

BORROMITE COMPANY OF AMERICA
1515 West Monroe St. CHICAGO

DRYERS

Built by the world's recognized dryer specialists

A user of the Proctor Raw Stock Dryer tells us that ever since the machine has been installed, it has been in continuous operation and has involved no expenditure, for upkeep or repair. Less power is required than with the older methods of drying, resulting in a considerable saving. Another user has spent only two dollars for repairs in about 11 years.

PROCTOR AND SCHWARTZ, INC.
Formerly Philadelphia Textile Machinery Co.
605 Tabor Road, PHILADELPHIA

"Proctor" DRYERS

TAG CONTROLLERS

The RIGHT Combination 4-6-0

THE Right Combination of Time and Temperature in your Dyeing Kettles is the determining factor in the production of evenly dyed goods.

Catalog 460 points out the way to perfect dyeing—and to savings in product, time, labor, and steam.

It describes, explains, and illustrates the automatic regulation of the entire operation of Piece dyeing as performed by the TAG-ROESCH Time-Temperature Controller.

It tells how this Controller besides exactly regulating the temperature and time periods, automatically shuts off the steam and sounds an alarm or flashes a signal at the end of the boil.

4-6-0 opens up some very interesting information for you.

Send for your copy. Just ask for Catalog K-4-6-0.

C. J. TAGLIABUE MFG. CO.
18 to 88 Thirty Third Street
BROOKLYN, N.Y.

"BRETON" MINEROL "F"

For

Cotton Yarns

"It stays on the Yarn"

BORNE, SCRYMSER CO.,
80 South Street, NEW YORK
BOSTON PHILADELPHIA
Works: Elizabethport, N. J.

AKO AKO AKO

HEADQUARTERS OF RAW MATERIALS for the TEXTILE INDUSTRY

Carbonate of Soda	Caustic Potash
Chloride of Lime	Caustic Soda
Aniline Oil	Aniline Salt
Gum Tragacanth	French Talc
Gum Arabic	Glycerine
Gum Karaya	Verdigris

Olive Oil Commercial
Imported Zinc Oxide

Inquiries Solicited

A. KLIPSTEIN & CO.
644 Greenwich Street, New York City

AKO AKO AKO

The room that houses the artificial memory — the Du Pont Dyestuffs Library.

The Room That Makes An American Dye Industry a Fact

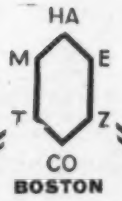
AS vitally necessary for the protection of American Dyestuffs users as the dye making plant itself, has been the work of the Du Pont Company in the careful collection of all available data on every branch of dyestuffs manufacture.

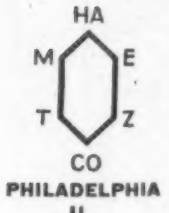
Here, in the scholastic quiet of this beautiful room, our research and experimental chemists check their data against that of hundreds of recognized authorities. Here, contained in thousands of volumes, is the cumulative knowledge of all the world on the subject of dyestuffs, available for the use of the manufacturers of America.

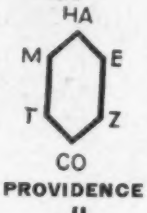
E. I. du Pont de Nemours & Co., Inc.
Dyestuffs Sales Department
WILMINGTON, DEL.

DU PONT DYESTUFFS

The chemist carries in his mind and in his notebook numberless details of operations, but it is necessary to have in the works a *permanent memory* — the library — to avoid duplication of effort in research and analytical work. The Du Pont Company employs thirty-seven people in its Intelligence Division who devote themselves to keeping the library up to the minute.







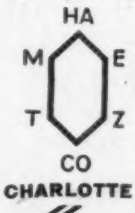
MORE than 40 years in the merchandising and manufacturing of dyestuffs has given us an insight into the intricacies of the many problems with which you are confronted and a wealth of information and experience which is always available to you.

We feel justified in soliciting your business by virtue of past performances and service, assuring you of our continued earnest desire to co-operate with and serve you.

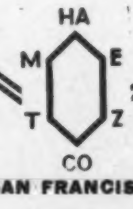
Aside from the line of colors made in the U. S. by

CONSOLIDATED COLOR & CHEMICAL CO.
and
CENTRAL DYESTUFF & CHEMICAL CO.,

we will be glad to procure for you on Import Licenses that may be granted you by the War Trade Board such colors as are available and made by the Farbwerke-Hoechst, Farbenfabriken vorm. Fried. Bayer & Co., Leverkusen, Leopold Cassella & Co., Frankfurt, Kalle & Co., Bieberich, and Griesheim-Electron (Oehler) of Frankfurt. Licenses are granted for colors not made in the United States or not made in sufficient quantities or at reasonable prices. All products brought over on Licenses will be obtained by us at the lowest prices quoted for export to anyone or any Government by the manufacturers.



H.A.METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence Chicago Charlotte San Francisco



VICTORIA SIZING SOFTENING BLEACHING FINISHING PRODUCTS

"VICTORIA EMULSIFYING LIQUID"

is an exclusive and unique emulsifying material which is used in compounding paraffin with vegetable and animal fats and oils. This preparation used in the rinse bath produces deeper shades, enhances the value of light shades and gives more lustre to the finished fabrics. For the use and suggested uses of this VICTORIA EMULSIFYING LIQUID our services are always at your disposal, and formulas for the best method to obtain any desired finish on any fabric will be cheerfully given. Write for our letter "B" for further interesting facts.

VICTORIA PRODUCTS are universally used as the most efficient and economical adjuncts for the treatment of Silk, Wool, and Cotton Fibre and Fabrics in the process of sizing, softening, bleaching, finishing, etc., viz.:—

VICTORIA CONCENTRATED TALLOW EMULSIONS
VICTORIA SOLUBLE SOFTENING OILS
VICTORIA COCOANUT OIL EMULSIONS
VICTORIA WOOL OIL COMPOUNDS
VICTORIA SOLUBLE GREASES
VICTORIA TURKEY RED OILS
VICTORIA CHLORAL
VICTORIA CONCENTRATED SIZES
VICTORIA BLEACHING SOAPS
VICTORIA BLEACHING OILS
VICTORIA FINISHING OILS
VICTORIA LEATHER OILS
VICTORIA SILK OILS
VICTORIA WAX FNISHES

Victoria Products have won unqualified preference in the principal textile plants as to purity, concentration, uniformity and permanence produced. By virtue of our large manufacturing capacity and laboratory facilities, we are in a position to quote promptly and at prices consistent with the quality and service offered.

CONSOLIDATED COLOR & CHEMICAL CO., Inc.

H. A. METZ, President

122 Hudson Street, New York

Medal Received at the
World's Columbian Exposition

Chicago **1893**

OUR WORKS AT BROOKLYN, N. Y.

Largest factory of sizing, finishing and weighting materials of America

Weighting Materials

Lancashire Acme Size	Fillerine	Weightening Softener

Specials

Special Warp Size 1809 B	Slashing Oils	Rectified Tallow

Sizing and Finishing Materials

Gums	Compounds	Softeners
Gum G.	Victor Compound	Bradford Grease
Gum Export	Sizeoleum	Soluble Tallow
Kleister	Gloria Warp Size	Softening Oils
Scotch Gum	Manchester Size	Arabol Tallow
Polishing Gum	Pearl Sizing	Sphinx Softener
Yorkshire Gum	Scotch Size	Soluble Oil

Arabol Hosiery Finish B. G.

Tell us what you make. We will tell you what to use.
We manufacture for all counts and constructions in Weaving and Finishing.

Arabol Manufacturing Company

100 WILLIAM ST., NEW YORK

Southern Sales Agent, CAMERON McRAE, CONCORD, N. C.
Representative, Georgia, Alabama, Tennessee: Guy L. Melchor, Atlanta, Ga.
Representative, South Carolina: R. P. Gibson, Greenville, S. C.

ZAVON

The Super Solvent

The manufacture of ZAVON, the well known textile solvent has been taken over by a new company and extensive factories have been put in operation at Danbury, Conn.

Here in the new factories ZAVON will be manufactured on an extensive scale to supply the textile industry with this superior solvent.

In the kier, the open kettle, or for all softening purposes, ZAVON is superior to soaps and soluble oils.

Send for working samples of **ZAVON** and learn the advantages of this effective solvent.

ZAVON COMPANY
Incorporated

60 Broadway
New York City

The Home of

VICTOR MILL STARCH

The Weaver's Friend

It boils thin—penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

The Keever Starch Company

Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience

Improve Your Blacks

"Developene"

Turns a *Rusty Black* to a *Lustrous One.*

THERE is no slight of hand connected with it. Send a pair of stockings, a skein of yarn or a sample of fabric, which has been dyed black, washed but not finished, to our Laboratory.

We will finish it with "Developene" and return to you. There will be such an improvement you will want "Developene" for your dye house right away.

MANUFACTURED ONLY BY

KALI MANUFACTURING CO.

1404-1410
N. Front Street

1409-13
N. Hope St.

MANUFACTURING CHEMISTS

PHILADELPHIA, PA.

Salicylic Acid Prevents Fermentation of Size.
Sole Manufacturers of Hydroxy Oils and

Kali Chlorine Neutralizer--The Superior Anti-Chlor.
Formaldehyde

ESTABLISHED 1815

ARNOLD, HOFFMAN & CO., Inc.

PROVIDENCE, R. I.
BOSTON, MASS.

NEW YORK, N. Y.
PHILADELPHIA, PA.

CHARLOTTE, N. C.

Importers and Manufacturers of

STARCHES, GUMS, DEXTRINE, ALIZARINE ASSISTANT, SOLUBLE OIL, SOAP

And Every Known Material from Every Part of the World for Starching, Softening, Weighting and Finishing Yarn, Thread or any Fabric.

Special Attention Given by Pratical Men to Specialties for

SIZING, SOFTENING, FINISHING AND WEIGHTING

Cotton, Woolen and Worsted Fabrics combining the latest European and American Methods.

We believe there is No Problem in

SIZING OR FINISHING

That We Cannot Solve.

FORMULAS for the best method of obtaining any DESIRED FINISH on any fabric cheerfully given.

The Grasselli Chemical Co.

DYESTUFF DEPARTMENT"

Works at:

GRASSELLI, N. J. **ALBANY, N. Y.**

SULPHUR COLORS: Black, Blue, Brown, Green.
Direct Cotton Colors, Acid and Chrome Colors
MONOPOLE BRILLIANT OIL
Bichromate of Soda **Sodium Sulphide**
Zinc Dust, Chemicals and Acids

BRANCH OFFICES:

New York	Philadelphia	Birmingham	Charlotte	St. Paul
Boston	Chicago	Cleveland	Cincinnati	Providence
St. Louis	Detroit	New Orleans	Milwaukee	

The Grasselli Chemical Company, Limited

Toronto **Hamilton** **Montreal**

Sole Selling Agents for Essex Aniline Works, Inc., Boston, Mass.

ALTHOUSE CHEMICAL COMPANY

Office and Works

500-540 Pear St., Reading, Pa.

Manufacturers of

Direct, Union and Chrome Colors

ALTHOUSE CHEMICAL COMPANY

Mercerizing Gassing Bleaching

We have a new and strictly modern plant for mercerizing, gassing and bleaching.

Located as we are in the center of the combed yarn spinning industry of the South, we are enabled to furnish you with the highest quality processed yarns in all numbers.

The American Processing Company

Mount Holly, N. C.

NEW YORK REPRESENTATIVE:
H. B. ROBIE,
No. 346 Broadway,
New York City.

SELLING AGENTS,
THE RIDDLE COMPANY,
Mariner & Merchant Bldg.,
Philadelphia.

JACQUES WOLF & CO.

Manufacturing Chemists & Importers

MAIN OFFICE and WORKS: PASSAIC, N. J.

New York Office: 112 John Street.

HYDROSULPHITES

For All Purposes

All Sizing and Finishing Products for Cotton

Bensapol
Bleaching Oil
Cream Softener
Glasgow Sizing
Levuline
Soluble Oils
White Finish

MONOPOLE OIL

Reg. Trade Mark No. 70991

SURPASS CHEMICAL CO. FOR USE IN AUTOGYP PROCESS OF DYEING. AUTOGYP PATENTED IN U.S.A. SEPT. 16, 1919. IN CANADA OCT. 10, 1919. ALBANY, N.Y.

DYEING and BLEACHING In *ONE* Liquor

Manufacturers of Cotton Underwear, Gloves and Hosiery who have been in the habit of dyeing Egyptians and other light shades over a lime bleach bottom have been quick to adopt the Auto-Gyp Process of Dyeing. They have eliminated the use of chloride of lime with its attendant worries and dangers and perform the whole operation of bleaching and dyeing in one liquor. This process eliminates all spects, motes, leaf and shives, preserves tensile strength, saves shrinkage, steam, labor, water and chemicals. The process requires only three hours' time to turn out a batch of goods where it formerly took 6 hours.

Let us prove our claims at our expense in your plant. Write today for full information.

SURPASS CHEMICAL CO., Albany, N. Y.

AUTO GYP
Process of Dyeing

Starch

Eagle Finishing

The experience of critical operators has shown this popular brand to be the most efficient sizing agent, both for additional WEIGHT and increased STRENGTH of WARP. Penetration accomplishes these important results.

EAGLE FINISHING is specially manufactured to cover a wide range of fluidities to meet the needs of all classes of weaves.

EAGLE FINISHING penetrates.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

Boston **Philadelphia** **Chicago** **Columbus, Ga.**

Midland Blue R

Midland Vat Blue 5 B

Are Vat Blues of special interest to all manufacturers of fast color Ginghams and Chambrays—of good fastness to washing, chlorine and light—suitable for both raw stock and yarn dyeing. For the same trade we also have some new sulfur colors of extreme brilliancy.

Aniline Dyes and Chemicals, Inc.

Cedar and Washington Streets **New York**

BOSSON & LANE

Manufacturing Chemists

Specializing

in

BLEACHING
DYEING
SIZING
AND
FINISHING
TEXTILES

Works and Office
Atlantic, Massachusetts

ATLANTIC BLUES

In addition to our Atlantic Blue B Extra Cone, we have just brought out a redder and brighter mark of Sulphur Blue, designated ATLANTIC BLUE R EXTRA CONCENTRATED.

This R mark is especially suited for dyeing fast reddish or violet blues on loose cotton, yarn, warps and pieces.

Additional shades of Atlantic Blues will soon be announced.

Atlantic Dyestuff Company

WORKS: PORTSMOUTH and BURRAGE
MAIN OFFICE, BOSTON
NEW YORK PHILADELPHIA CHARLOTTE
CHICAGO PROVIDENCE

Stauss Soluble Tallow and Gum

Soluble Oils for all warp sizing and finishing purposes. None better. Manufactured by Geo. P. Stauss.

Importers and Distributors of

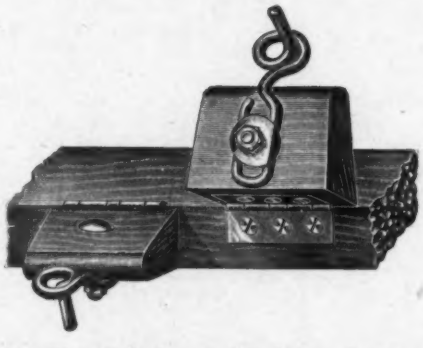
Starches Softeners Weighting Compounds

We handle all kinds of Textile Mill Supplies, Mill Paints, etc.

WRITE, PHONE OR WIRE

Southern Distributing Co.
MANUAL FAULKNER, General Manager
50 Market Street Charleston, S. C.

The Palmer Adjustible Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY
Middletown, - - - Connecticut

Doffing Cars Have an

unlimited use in textile mills. The car illustrated above is extensively used not only because it serves its purposes well, but because it costs little.

While our doffing cars can be made to any specifications, the usual combination consists of two boxes, one attached to a platform and one movable. The platform is mounted on four self-oiling casters so arranged that it is very easy to turn the car in a short radius.

Being made from Diamond Fibre and according to Diamond-F Standards, we can guarantee these cars to render better service and to last longer than other doffing cars. Fill in and mail the attached coupon today. We will send you complete information.

Dept. WZ

Diamond State Fibre Company

Bridgeport (near Philadelphia), Penna.
Branch Factory and Warehouse, Chicago,
Offices in Principal Cities.
In Canada:
Diamond State Fibre Co. of Canada, Ltd., Toronto.

Diamond State Fibre Co.,
Bridgeport (near Philadelphia), Pa.

Gentlemen:—Please send me complete information regarding the doffing cars and other textile mill receptacles.

Name .....

Address .....

City .....
Dept. WZ.

Nickle-Plated Drop Wires

—IN ANY SIZE OR STYLE AT ONLY—

25c Per Thousand

above the price for regular finish. Our drop-wires are made of the best grade steel wire.

STEEL HEDDLE MANUFACTURING CO.

Greenville : Philadelphia : Providence

Southern Office, Hampton Smith, Mgr., 111 Washington Street, Greenville, S. C.

S. S. & F. Co., Inc.

CHARLOTTE, N. C.

The S. stands for Southern, the S. & F. for Safety First

The only Flyer Presser Manufacturers in the South. Does your machinery need OVERHAULING? Does your Steel Rolls, Flyers, Spindles, etc., need REPAIRING? Are you NEEDING Flyers, Flyer PRESSERS, Rings of any kind, Guide Wires or any other supplies? If so, this is YOUR BUSINESS — OUR BUSINESS IS SUPPLYING these needs.

Southern Spindle & Flyer Co., Inc.

CHARLOTTE, N. C.

W. H. MONTY, - Pres. and Treas.
W. H. HUTCHINS, - Vice-Pres. and Sec.

AMERICAN SUPPLY COMPANY

PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

Leatheroid
MILL RECEPTACLES

The Truly Permanent Fibre Cars

Leatheroid No. 3 All Fibre Car. Solidly Built. All wearing surface protected.

Leatheroid Cars, as all Leatheroid receptacles, are made of "Leatheroid"—the most durable and toughest, smooth fibre known, and the other parts are chosen with care, and put together right.

Leatheroid Cars stand the heaviest loads and roughest usage day after day, year after year, and then show very little effects of wear.

Leatheroid Cars, Roving Cans, Boxes, Baskets, etc., are made in all sizes and shapes.

Sold by Leading Southern Mill Supply Houses.

Rogers Fibre Company

Leatheroid Sales Division

1024 Filbert Street, Philadelphia

Leatheroid No. 2 Steel-Clad Car. Nothing Equals it for Construction, Finish and Serviceability.

SPINNING RING SPECIALISTS SINCE 1873

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE SPINNING RING CO.
WHITINSVILLE, MASS.

Many errors in business and trade operation are avoided through the use of cost keeping Devices.
The Universal Recorder automatically keeps you **informed.** Wise Superintendents—and the Production manager as well—look to the day when the mill will be working to its limit.
Each machine should produce to its capacity. Are yours doing their utmost. Are they running at a loss or Profit?

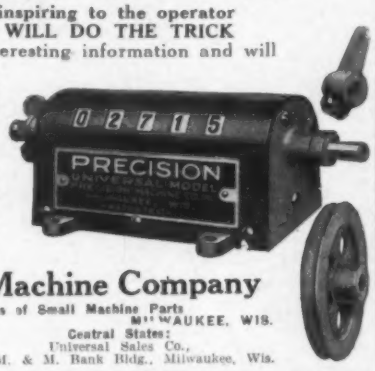
THE "UNIVERSAL" KEEPS YOU POSTED

Factory conditions and equipments are mighty factors in developing loyal workmen who will be alert to your production.

UNIVERSAL COUNTERS

Are inspiring to the operator
THEY WILL DO THE TRICK

We have some interesting information and will gladly send it to you—on receiving your request and address.
Our representative will call and give all required particulars if you will write to the factory.

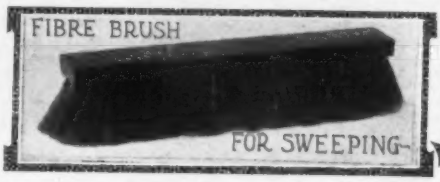


Precision Machine Company
Manufacturers of Small Machine Parts
415 CHESTNUT ST. MILWAUKEE, WIS.
Southern States: Louis Gordon, Atlanta, Ga.
Central States: Universal Sales Co., 301 M. & M. Bank Bldg., Milwaukee, Wis.

A Clean Sweep

Can be made only with a good sweep. A clean job of scrubbing can be done only with a good brush. The "Two-in-One" Combination Sweep and Scrubbing Brush is made strong of the best materials and stands hard usage and lasts longer than other brushes, with the added advantage that new bottom brushes may be purchased at reasonable cost, the handle and top being practically indestructible. Used as a scrubbing brush the operator stands up, permitting faster work than with the old-fashioned hand brush. It is more effective and robs the task of scrubbing of its unpleasant features.

SOUTHERN BRUSH AND BROOM COMPANY



601 Citizens and Southern Bank Bldg.
ATLANTA, GEORGIA.

GREENVILLE

Spools That Satisfy

Let us submit prices and samples on WARPER and TWISTER SPOOLS. Plain wooden head and metal shield. A list of Southern mills using Greenville Spools given on request.

GREENVILLE SPOOL & MFG. COMPANY
Greenville, S. C.

SPOOLS

Safety the First Consideration

You cannot afford to overlook any method of safeguarding your plant against Fire and Theft. The Safe Method is to keep your watchman watching.

THE ECO WATCH-CLOCK SYSTEM

will watch your watchman.

The Eco is an exclusive specialized product of thirty-six years standing.

ECO CLOCK COMPANY
196 Congress St., Boston, Mass.
24 Cortlandt St., New York
Southern Department: 23 Walton Bldg., Atlanta, Ga.

We Are Specialists In

Cafeteria Equipment

With particular reference to the needs of textile establishments.

Your whole order, from salt cellars to steam tables, can be placed with us with the assurance it will be handled quickly and right. Our experience in this line insures an intelligent appreciation of your needs, while the immense stock we carry in our Chattanooga warehouse, within a few hours' freight haul from your establishment, is a guarantee of speed in meeting your requirements, an especially valuable consideration in replacing broken dishes and glassware.

Prices will be found uniformly better than you may expect elsewhere, and the quality of every article is unsurpassed.

Won't you let us figure with you on your requirements? Our advice will be found extremely helpful in determining what will serve you best.

Chattanooga Queensware Company

CHATTANOOGA, TENNESSEE.

Specialists in Hotel and Cafeteria Equipment.

How to Maintain Beautiful Lawns at Minimum Expense

For a number of years Ideal Power Lawn Mowers have been demonstrating their efficiency in caring for large lawns. Many of the largest and best kept grounds in the country are cared for the "Ideal" way.

Because actual use by thousands of Ideal owners has shown conclusively that this combination **power mower** and **power roller** keeps beautiful lawns in better conditions than was ever possible with hand mowers or horse drawn mowers.

Not only does the Ideal permit better care, but also effects a genuine economy in up-keep. For one man with an Ideal Power Mower can cut from four to five acres of grass per day with little effort and at small cost. Then the fact that the Ideal is also a power roller practically doubles its usefulness.
It provides exactly what is needed for the early spring rolling, and keeps the sod in excellent condition the season through.

Ideal Power Mowers are used in caring for the grass on industrial grounds, private estates, public parks, cemeteries, golf courses, college grounds, school grounds, polo grounds, etc. Here are just a few names from the thousands of Ideal users: Archibald M. L. Dupont, Montchamin, Dela.; Dr. C. S. Hoover, Alliance, O.; Detroit Golf Club, Detroit, Mich.; Public Parks Dept., Hartford, Conn.; Cypress Lawn Cemetery, Colma, Calif.

With riding trailer the Ideal makes one of the most practical and economical riding mowers possible to procure. Furnished either with or without riding trailer.

Special putting green cutting unit can be provided for work on golf courses.
Any of our dealers will gladly demonstrate the Ideal for you. Special illustrated catalog upon request.

IDEAL POWER LAWN MOWER CO.
R. E. Olds, Chairman
431 Kalamazoo St., Lansing Michigan
Representatives in All Principal Cities.

IDEAL POWER LAWN MOWER

Does the work of five hand mowers

ALL OVER The South

THEY ARE SPECIFYING

DOUBLE REGNAS DIAMOND

TRUCKS

Fig. 200
GENERAL DUTY TRUCK
Size 27 x 48 Capacity 1500 lbs.

Over 300 Styles

A Truck for Every Purpose

SPECIAL TRUCKS TO ORDER

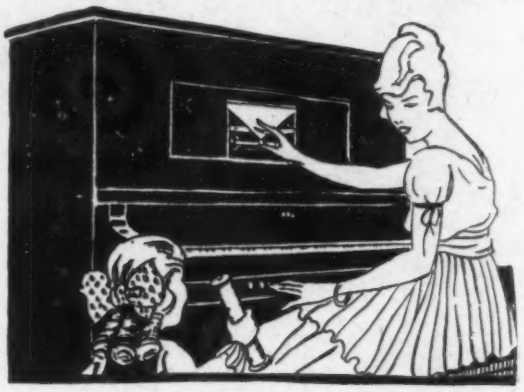
Prompt shipment on all standard sizes and styles of Hand Trucks and Platform Trucks.

J. R. Regnas & Co.

MANUFACTURERS

ATLANTA : : GEORGIA

CHOOSE YOUR PIANO WISELY



And no better choice could you make than to select "THE SOUTH'S MOST POPULAR PIANO"—the STIEFF. Has been making the kind of pianos that the real lover of music appreciates—sweet, lasting tones, beautiful cases. Our "PLAY WHILE YOU PAY PLAN" makes purchasing one easy and pleasant. Write for catalog.

CHAS. M. STIEFF
INCORPORATED
M. D. MANNING, Manager
CHARLOTTE, N. C.

The VERTICO-SLANT

Is a practical solution of the drinking fountain problem, with its stream of minimum slant—the stream that cannot be contaminated.
Lips cannot touch the nozzle, which is raised only slightly above the sloping base of recess. The copious drinking feature of the vertical stream is retained in the Vertico Slant, as the mouth comes in contact with the stream at a point where it loses its momentum.
Glass or cup can be filled easily from this stream.
The fountain that prevents squirting, tampering or pilfering, and uses less water than the average old-style globe shaped drinking fountain.

The ideal fountain for hospitals, offices, factories, picnic grounds, etc.

RUNDLE-SPENCE MFG. CO.
MILWAUKEE WIS.

PURO SANITARY DRINKING FOUNTAINS ARE NO LONGER A LUXURY

The up-to-date manufacturer found out that they are time savers—save time by reducing loss of time on account of sickness among your employees—and save time by having a cool drink of pure water available at all times.

PURO Drinking Fountains are cast bronze metal—beautifully nickel plated—so simple that even a child can operate it—yet—there is nothing to get out of order.

For Your Own Protection Install PURO Sanitary Drinking Fountains.

Southern Sales Manager
E. S. PLAYER
Masonic Building
Greenville, S. C.

Manufactured Exclusively by

PURO SANITARY DRINKING FOUNTAIN CO.
HAYDENVILLE, MASS., U. S. A.

White Hickory
BUILT ON HONOR

Judge Them By The Miles of Service

Miles of Service are assured by these Units.
Continental Red Seal Motor, Eiseman High Tension Magneto, Sheldon or Timken Worm Drive Axles, Timken Bearings and all other units of highest standard grade.

The initial cost of a motor truck is only a percentage of the total transportation cost. It is *Miles of Service* that count.

You can rely on White Hickory Trucks. They stand up under adverse conditions—they give miles of service at an extremely low hauling cost, with any kind of a load, on every kind of road.

Back of the White Hickory Truck is the forty year record of the White Hickory Wagon.

White Hickory Motor Corporation
Atlanta, Georgia, U. S. A.

THIS
CONVINCING COMPARISON
SHOWS THE SUPERIORITY OF
SIGNODE SYSTEM
OVER THE USUAL BALE TIE.
LET US SEND YOU FULL DETAILS
SIGNODE SYSTEM, INC.
CHICAGO ATLANTA
Boston New York Philadelphia Toronto San Francisco

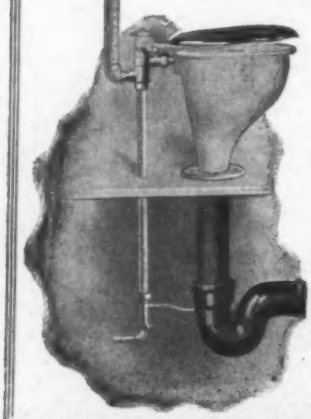
$\frac{5}{8}$" x .015 SIGNODE TIE	COSTS 12 % LESS PER FOOT	HOLDS UNDER 800 LBS. PULL	NO "SPIDER" TO INJURE HANDS
Compared with			
USUAL $\frac{5}{8}$" x .017 BALE TIE	COSTS 12 % MORE PER FOOT	BREAKS UNDER 500 LBS. PULL	DANGEROUS "SPIDER" OFTEN PRESENT

TEXTILE SCALES

No. 5005. Gives yards per pound
No. 5000. Gives ounces per running yard
No. 5010. Gives yarn number for cotton yarns
No. 5015. Gives yarn number for woolen yarns
Used by U. S. War and Navy Depts.
CHRISTIAN BECKER'S ANALYTICAL AND SILK BALANCES
THE TORSION BALANCE CO.
Main Office, 92 Reade Street, New York
FACTORY: Jersey City, N. J.
BRANCHES: 31 W. Lake St., Chicago. 49 California St., San Francisco.

VOGEL PATENTED
FROST PROOF CLOSETS

They require no pit.
They save water.
All bowls have enameled rims. In service daily, winter and summer.
No. 1



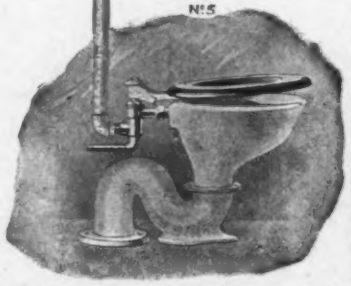
OVER 350,000
Giving
Satisfaction in All Climates
The ideal water closets for Factories and Mill Villages, where thousands have been installed.
The most durable water closets made — excepting none.

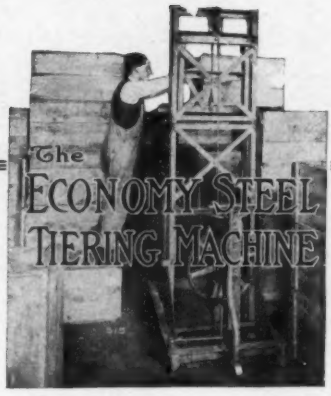
Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSIST ON GETTING THE VOGEL
Ask your jobber
JOSEPH A. VOGEL CO.
Factory and Office at
WILMINGTON, DEL.

VOGEL PATENTED
No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.
No. 5





Are Sales Off?

Are you storing your finished product ready to make "Immediate Delivery?"

J. D. COLLINS
STORAGE EQUIPMENT
926 GRANT BLDG.,
ATLANTA, GA.

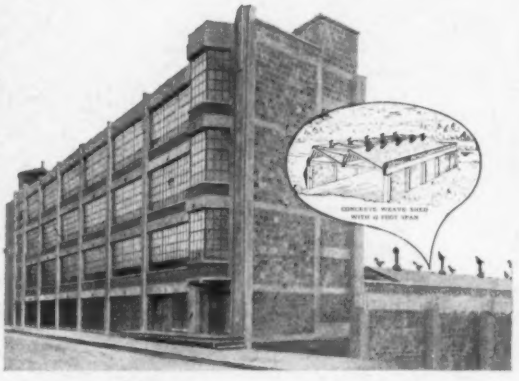
has the equipment that will reduce your storage and handling expenses. Tiering machines, Electric and hand trucks, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request.

Acme DOORLESS Baler
Patents Pending

A 600-lb. bale of **Cotton Waste** measures 60 x 22 x 22 when compressed in the **Acme** Doorless Baler. Consider the large saving in storage room and the greater quantity you can load in cars. Built in numerous sizes and pressure capacities.

Galland-Henning Mfg. Company
MILWAUKEE, WIS.
SOUTHERN SALES REPRESENTATIVE:
THE LOVINGOOD COMPANY, Atlanta, Ga.



Factory, and Weave Shed with 42-foot Span, Concrete Saw-tooth Roof. Designed and constructed for Sidney Blumenthal & Co., Inc., at Shelton, Conn.

Expect the Utmost

THE Thompson & Binger organization is not new, nor old; not small, nor large. It is old enought to have acquired reputation, altho this reputation is not of such long standing that it need not be lived up to; its personnel is far too large to be designated small, but not so large that one of the two principals does not know the status of your job, every day.

You, as a client of Thompson & Binger, Inc., should expect the utmost in design and construction.

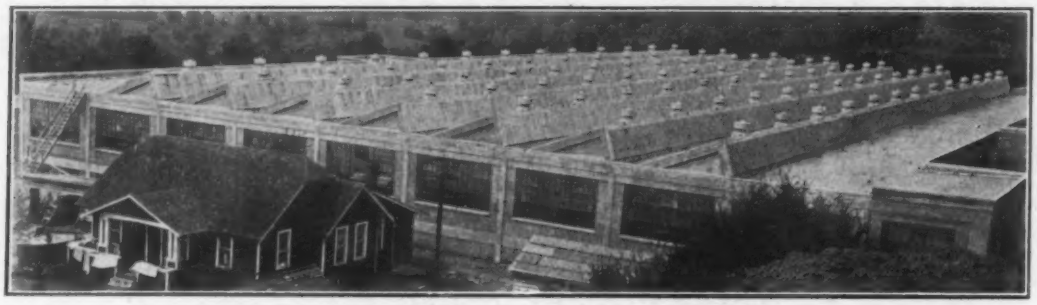
THE ENDICOTT-JOHNSON WORKERS have chosen us to do the designing, engineering, and construction of all concrete buildings to be erected by them.

THOMPSON & BINGER
INC.
ENGINEERS & CONTRACTORS
CONSULTATION - DESIGN - CONSTRUCTION

NEW YORK
280 MADISON AVE.

SYRACUSE
GURNEY BUILDING

CONCRETE



New Weave Shed of Columbus Mnfg. Co., at Columbus, Ga.

Another big cotton mill builds with

CRUSHED **ENSLEY BASIC SLAG** SCREENED

This big weave shed recently built for the Columbus Mfg. Co. by T. C. Thompson Bros. & Co. (Charlotte, N. C.) is another noteworthy example of the use of reinforced concrete in fire-and-repair-proof construction.

No expense of time or money was spared to make this structure modern, efficient—and enduring. It has mastic floors and a built-up slag roof which were laid by the Interstate Roofing and Foundry Co. of Anniston, Ala.

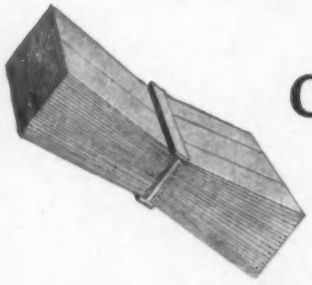
Optimism is the word of the hour! In new construction mill owners are solving many of the problems of reconstruction—reducing the labor turnover, lowering the unit cost thru increased production, safeguarding valuable mill properties by making them fireproof, vermin proof, repair proof. Build now! Costs are back to normal. Build right! Efficiency demands and economy suggests reinforced slag concrete.

BIRMINGHAM SLAG COMPANY

Branch Sales Office: Walton Bldg., ATLANTA, GA.

BIRMINGHAM, ALA. TWO PLANTS: ENSLEY, ALA.—ALABAMA CITY, ALA.

Branch Sales Office: Williams Bldg., THOMASVILLE, GA.



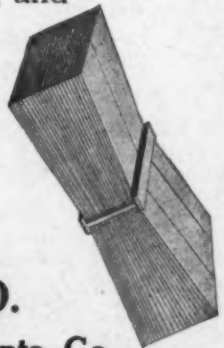
"Never-Rot" Creosoted Pine Shingles

Give Longer Life at Less Expense Than the Highest Price Untreated Shingles

Our "NEVER-ROT" creosoted pine shingles are thoroughly impregnated with pure refined creosote by our special Hot and Cold treatment, which prevents their decay, and by its waterproofing action lessens warping and shrinking.

Reduce Your Annual Roofing Costs 60% by the use of "Never-Rot" Creosoted Pine Shingles

Write us for carload prices delivered F. O. B. cars at your city.



GULF STATES CREOSOTING CO.

P. O. Box No. 1022 Atlanta, Ga.

When Hampden Sunray Mill White Paint Comes In The Imps Of Darkness Go Out

Hampden

Sunray Mill White Oil Paint

JUST as steel leaps to meet the magnet, so light floods in to play on walls "Sun-surfaced" with Hampden *Sunray* Mill White Oil Paint.

Here is a snow white paint that costs about the same per gallon as any paint used for protection of surfaces only and not a cent more to apply it. Yet see how much more you get for your money when you specify Hampden *Sunray* Mill White Oil Paint.

25 to 60 per cent. more light; Covers more surface per gallon; Lasts Longer—You paint less often; Washable—Makes your annual cleaning simply a "Wash Down" instead of a "Paint up."

Three Finishes: Gloss, Eggshell (Semi-gloss) Flat

Delivered direct from Factory or Local Dealers.
Send for Booklet, "WHITEST WHITE."

HAMPDEN PAINT AND CHEMICAL COMPANY

Makers of Good Paint for 68 Years

DIVISION E, SPRINGFIELD, MASSACHUSETTS

PAINT Hampden COATINGS

New Spinning Mill and Cotton Storehouse Bay State Cotton Corporation, Lowell, Mass.

A WISE PRECAUTION

Overcoming high production costs

THE manufacturer who is still paying war wages for labor, but who no longer receives war prices for his product, is faced with the urgent necessity of economizing in production methods.

This makes it doubly important today to take advantage of every means to save labor wherever possible and to render labor more productive wherever used.

Not long ago the Bay State Cotton Corporation, manufacturers of high grade tire cord and fabrics concluded to erect another spinning mill and cotton storehouse.

In planning the mill, it was the pleasure of Lockwood, Greene & Co., Engineers, to devise the means of effecting a substantial saving in the payroll by installing a complete system of mechanical conveyors; to devise a means for conserving the freshness and energy of the workers by providing for a change of air in the mill every six minutes; to devise a means for procuring the many benefits which accrue from good daylight by providing the greatest possible amount of daylight in all parts of the mill; to devise a means for utilizing the floor space to get the greatest advantage by carefully planning the layout of machinery and auxiliaries and adapting the building design to meet the layout conditions.

BUILDING WITH FORESIGHT

In all respects this mill embodies the most modern developments in production economy. The experience and the creative facility which planned it are at the command of all manufacturers.

LOCKWOOD, GREENE & CO.
ENGINEERS

EXECUTIVE OFICE, 60 Federal Street, BOSTON

BOSTON ATLANTA CHICAGO NEW YORK
DETROIT CLEVELAND CHARLOTTE PHILADELPHIA

LOCKWOOD, GREENE & CO. OF CANADA, LIMITED
285 Beaver Hall Hill, MONTREAL SANTIAGO, CHILE

COMPAGNIE LOCKWOOD GREENE, 47, Avenue de l'Opéra, PARIS, FRANCE

It's Better to Be Safe Than Sorry

Make your plant safe now and you will never have to be sorry that you did not protect yourself against loss by fire. You cannot exclude from your establishment all causes of fire, but you can automatically control possible fire and confine it to a small section of the building by means of

RICHARDS-WILCOX FIRE DOORS AND AUTOMATIC FIRE DOOR HARDWARE

Inspected and labeled under direction of the Underwriters' Laboratories, Inc.

Stops fires at the beginning—before the fire department arrives, before the alarm is turned in, before anyone knows there is a fire.

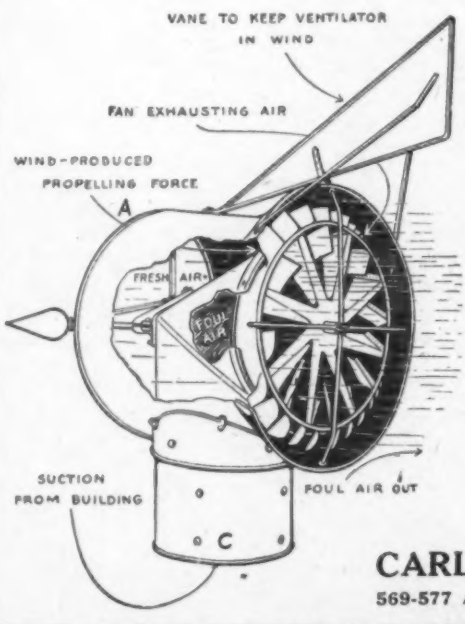
The R-W line of fire doors and fire door hardware is the most extensive and complete manufactured. Fits every possible doorway condition.

Illustrated book describing Fire Doors and Automatic Fire Door Hardware for all purposes, sent without obligation.

Richards-Wilcox Mfg. Co.
"A Hanger for any Door that Slides"
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA AURORA, ILLINOIS, U.S.A. LONDON, ONT. BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO

The Wind Mill Principle Applied to a Ventilator

Note the illustration! The fresh air passing over the funnel comes in contact with the small outer blades, thereby propelling the wheel to which the large inner blades are also attached. These revolving inner blades create a vacuum which sucks the foul air from below. Perfectly simple—like so many of the world's ingenious inventions. The



Carlisle Force-Draft Ventilator

displaces from 5 to 6 times as much air as ordinary ventilators. You can replace your present inefficient Ventilators with fewer and smaller-sized "Carlisles" and get more ventilation!

Write for descriptive folders.

CARLISLE & GALE CO.
569-577 Albany St. Boston, 18, Mass.

SAVE WASTE

Ball Bearings on the measuring rolls of slasher warpers will do it.

AldricH MachinE

Ball **WorkS** Bearings

Greenwood, S. C.

Good Key Seats

Are Milled With the NATIONAL

Mills keyseats in one cut by means of a rotary milling cutter. Can be used in every shop, large or small. It mills keyseats in places a keyseating machine cannot reach. A drill press is all that is needed with this tool to mill your internal keyseats. It fits your drill chuck just like any straight shank drill or taper chuck can be had to fit the spindle. No chucking required of work when using this tool for milling your internal keyseats. The work is held by hand. The tools are made in twenty different diameters in the sizes most commonly used. Eccentric bushings are made for each diameter tool, so that all tools can be bushed to meet any diameter above your own. This tool is a quantity producer and is used where parts are keyseated by thousands.

Get Catalog C

National Machine Tool Co.

2274 Spring Grove Ave., Cincinnati, O., U. S. A.

Southern Representatives

Smith-Courtney Co., Richmond, Va.

Montgomery & Crawford, Spartanburg, S. C.

COOLEDGE HYGRADE

C THE CH LINE H

"Best for the Southern Climate"

C-H Bungalow Shingle Stains

For Shingle roofs and weather-boarding

C-H Home Paints

For Exterior and Interior Use

C-H Perma White

Interior gloss mill paint

Let us Send Booklet and Color Card Also names of Mills and Mill Contractors that have used our paints

"IMMEDIATE SHIPMENTS"

Just write on your letter-head— "Send Your Catalog"

F. J. COOLEDGE AND SONS

ATLANTA GA. SAVANNAH

Manufacturers of paints, stains and varnishes

Jobbers of window and building glass, and wallboard

H. NEWTON MARSHALL CO.

CONTRACTOR PAINTERS

ATLANTA, GA. BOSTON, MASS.

D. R. Hall, Southern Manager

301 Trust Co. of Ga. Building.

ATLANTA, GEORGIA.

Service *Efficiency* *Low Cost*

Olympia Mill, Columbia, S. C.

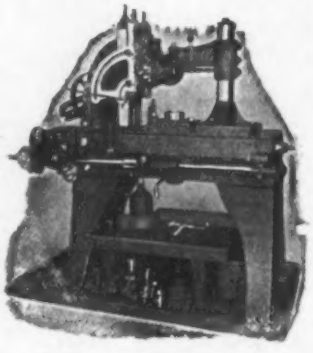
For twenty years our specialty has been painting mills and other industrial plants while in full operation without interrupting output or adding to the cost of painting.

Goods in Process Carefully Protected.

Write us for estimation, can furnish more than five thousand mills and industrial plants throughout the country for reference.

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!



Especially Adapted for Use in

Cotton Mills.

Hundreds Now in Use.

Send for special circulars.

The D. E. Whiton Machine Company

New London, Conn.

You're Losing Money If Your Welding Gas Isn't Absolutely Pure

Regardless of the quantity of oxygen gas your welding jobs consume, if this gas isn't the purest that can be bought, you are losing money. The purer the gas, the lower your welding costs.

STANDARD OXYGEN IS 99.5 PURE

In addition to our Oxygen Plant at Chattanooga and Gretna, La., we have recently opened a new plant at Atlanta, which we believe is the largest and most up-to-date Oxygen plant in the South, and greatly increases our facilities for service.

This Oxygen is of the same high grade as the other Standard Welding products. The cylinder and valve equipment is the latest and most up-to-date, and we can guarantee prompt shipments.

Our long experience in Cotton Mill work is at your command, and we should be pleased to quote prices on Oxygen or welding equipment and supplies.

Write, Wire or Telephone Us.

Standard Gas Products Company
(INCQRPORATED)

Main Office, Atlanta, Ga, Gretna, La. Chattanooga, Tenn.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA.

Branch Office, 141 Milk St., Boston, Mass.

20

One of many Connecticu Factories Equipped with Jewell Belting.

Jewell Belting

1770—1920

IN these days of large-scale production, men in charge of modern plants are giving their best thought to the standardization of both the product itself and the methods of manufacture. Power transmission in all its phases becomes more than ever a vital factor in their calculations.

It is but natural that they should find the satisfactory solution for this part of their problem in the installation of Jewell belting—belting which has rendered truly efficient service ever since machine power has driven wheel in America.

Jewell Belting Company

Hartford, Conn.

Western Branch: 2837 So. LaSalle St., Chicago

NON-FLUID OIL

Why Pay for Lubricants that don't Lubricate

When your doffer boy takes time off you dock his pay. But when oil wastes out of bearings and does no work at all you pay for it just the same.

No idle lubricants when you use

TRADE MARK REGISTERED IN **NON-FLUID OIL** UNITED STATES PATENT OFFICE

Modern Textile Lubricants

They Won't Drip or Spatter!

Meaning:

Every drop of Lubricant gives full service.

Lower lubrication cost.

No more Spoilage.

Fewer applications of lubricant—less labor cost.

Let's get together—just mail the coupon and we'll send testing samples and Bulletin on the Lubrication of Textile Machinery.

Southern Agent:
Lewis W. Thomason, Charlotte, N. C.

Warehouses:
Charlotte, N. C.; Atlanta, Ga.; New Orleans. La.

New York & New Jersey Lubricant Co.

401 Broadway
New York
N. Y.

N. Y. & N. J. Lubricant Co. Please send Testing Samples and Bulletin on "Lubrication of Textile Machinery" to

Name .....

.....

Address .....

.....

C-1-21

Did You See These Machines in Operation At the Southern Textile Exposition?

Hendey Engine Lathe

Brown & Sharpe Automatic Gear Cutting Machine

J. E. Snyder & Son Upright Drill Press

Brown & Sharpe Milling Machine

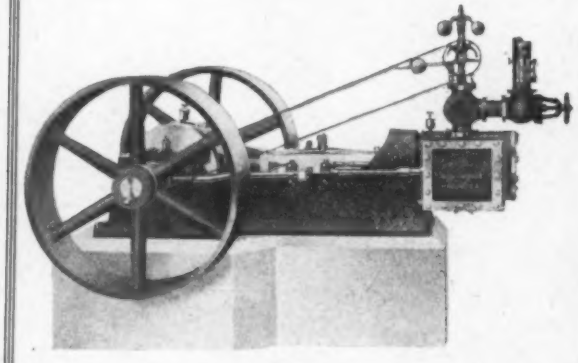
Brown & Sharpe Tool and Cutter Grinder

Hendey Crank Shaper

WE SHALL BE PLEASED TO QUOTE YOU ON YOUR REQUIREMENTS

THE WALRAVEN CO.

Machinery and Mill Supplies — Atlanta, Ga.



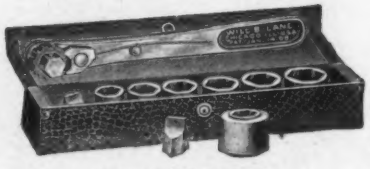
J. S. Schofield's Sons Co.

Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers,
High Grade Stationary Steam Engines,
Tanks, Stacks, Stand Pipes.
Heavy Castings and Wrought Iron Works.

Lane's UNIQUE Ratchet Tools



STANDARD SET
Consists of Ten Pieces

1—7-inch Ratchet Wrench (Drop-Forged)
2—Screw Driver Bits
7—Sockets—turned from solid round bar (Machinery Steel)—broached hexagon openings—fitting U. S. Standard Cap Screws 5-16 inch to 5-8 inch (except 9-16 inch) and Hexagon Nuts—1-4 inch to 1-2 inch (except 7-16 inch). S.A.E. Cap Screws and Hexagon Nuts 5-16 inch to 9-16 inch

Size of Socket Openings

1-2 inch fits { 1-4 inch Hexagon Nut / 5-16 inch Cap Screw
9-16 inch fits 3-8 inch Cap Screw
39-64 inch fits 5-16 inch Hexagon Nut
5-8 inch fits 7-16 inch Cap Screw
11-16 inch fits 3-8 inch Hexagon Nut
3-4 inch fits 1-2 inch Cap Screw
7-8 inch fits { 1-2 inch Hexagon Nut / 9-16 inch Cap Screw S.A.E. / 5-8 inch Cap Screw U. S.

Packed in strong Black Fibreroid Case
Weight 22 ounces

LIST PRICE, $4.00

WILL B. LANE UNIQUE TOOL CO.,
180 N. Dearborn St., Chicago, Ill.

FIGURE 124

Jenkins Standard Brass Y or Blow-Off Valves

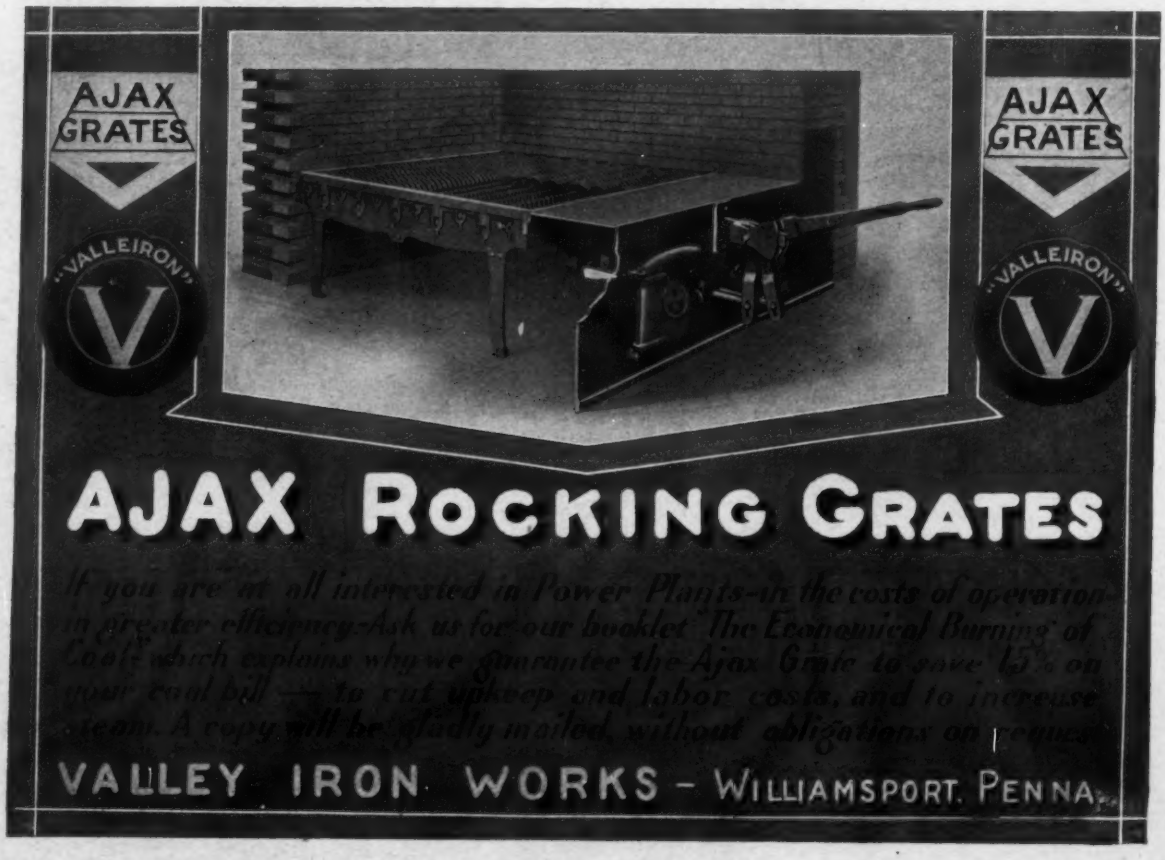
For 150 pounds working steam pressure; 250 pounds working water pressure. Fitted with Jenkins discs and renewable seat rings. Have full opening nearly in line with the pipe. Particularly adapted for boiler blow-off service, also extensively used where thick fluids are handled. Screwed or flanged types.

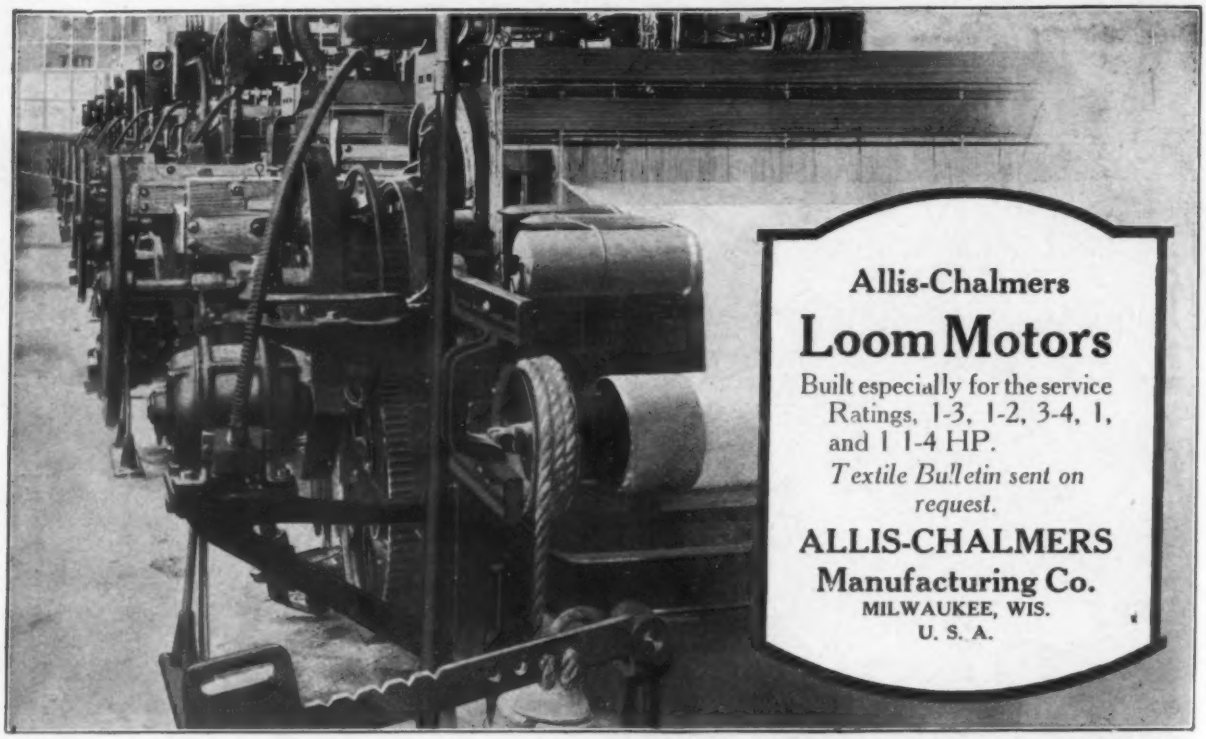
Genuine Jenkins Valves are known by the name and Jenkins Diamond Mark—at supply houses everywhere.

JENKINS BROS.

New York Boston Philadelphia Washington
St. Louis Chicago San Francisco Pittsburgh
Montreal London Havana

2223-J


AJAX GRATES
"VALLEIRON"
V
AJAX GRATES
"VALLEIRON"
V
AJAX ROCKING GRATES
If you are at all interested in Power Plants—in the costs of operation—in greater efficiency—Ask us for our booklet "The Economical Burning of Coal" which explains why we guarantee the Ajax Grate to save 15% on your coal bill — to cut upkeep and labor costs, and to increase steam. A copy will be gladly mailed, without obligation on request.
VALLEY IRON WORKS - WILLIAMSPORT, PENNA.



Allis-Chalmers

Loom Motors

Built especially for the service Ratings, 1-3, 1-2, 3-4, 1, and 1 1-4 HP.

Textile Bulletin sent on request.

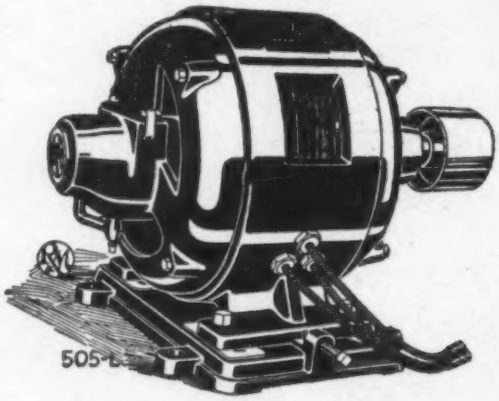
ALLIS-CHALMERS Manufacturing Co.

MILWAUKEE, WIS.
U. S. A.

BRYAN ELECTRIC COMPANY

58 Edgewood Avenue, Atlanta, Ga.

Electric Light, Power, Telephone and Bell Wiring for Residences, Stores and Factories. Estimates Furnished.



Rewinding for Motors, Generators

All kinds of new and used Electrical Machinery bought, sold and exchanged.

All Kinds of Electrical Work

MOTORS RENTED TELEPHONE YOUR WANTS
LOCAL AND LONG DISTANCE, Ivy 1788-1790.

Quick Action

Modern business demands it. Time is the most valuable asset of the executive.

STROMBERG-CARLSON INTER-COMMUNICATING SYSTEMS

add hours to the business day—eliminate loss of precious minutes—save endless unnecessary footsteps.

They are easily installed—require no switchboard or operator. Their operation is simplicity itself.

Push *ONE* Button *ONCE*—and Talk.

Dixie Electric Equipment Co.

INDUSTRIAL ELECTRICAL EQUIPMENT

Interior Telephones—Fire Alarm Apparatus.
Watchman's Clock Detectors.
Electric Clocks—Riot Alarms—Code Calling Systems.
A Southern Concern—Giving Service to the South.
Data and Complete Information on Request.

37 Peters St. Bell Phone Main 826.
ATLANTA, GA.

ECONOMY *renewable* FUSES

Knife-blade type Economy Fuse

Industries persisting in the use of "one-time" fuses pay more for electrical protection than those equipped with Economy Fuses.

The famous Economy "Drop Out" Renewal Link makes possible an annual saving of 80% in fuse maintenance costs.

Nothing is destroyed when an Economy Fuse blows but the inexpensive strip of fusible metal.

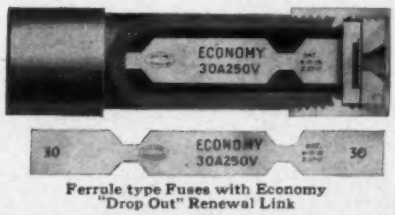
This is quickly and easily replaced with a new "Drop Out" Renewal Link without delay to men or machinery. The heavy cartridge, end caps and the winged washers which lock the fuse are virtually indestructible and are used again and again.

Check up fuse costs in your plant. And remember that Economy Fuses give maximum protection at minimum cost.

For sale by all leading electrical jobbers and dealers.

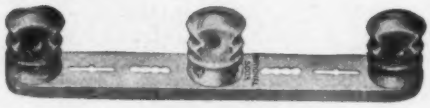
Economy Fuse & Mfg. Co., Chicago, U. S. A.

Economy Fuses are also made in Canada at Montreal



Ferrule type Fuses with Economy "Drop Out" Renewal Link

Economy Fuses were the first line using inexpensive bare links for restoring blown fuses to their original efficiency to be APPROVED IN ALL CAPACITIES by the Underwriter's Laboratories.



"NATIONAL" BRACKETS

NATIONAL Brackets are especially adaptable for use in carrying power lines in industrial plants, as well as for outside construction work. They are practically universal in application; they do not require tie wires; they are furnished complete with insulators. Write for Bulletin 602.

NATIONAL PRODUCTS
N
M M

National Metal Molding Co.

General Offices: Pittsburgh, Pa.

Atlanta Office:
Healey Building

Speed in Service is Only Rivaled by Accuracy
Each Would Be Useless Without the Other

Unfailing Service

In the struggle and stress of modern business life every moment of delay represents a loss of time and money which cannot be regained.

When promptness, accuracy and dispatch are the vital elements in the delivery of electric equipment or supplies it is natural to turn to the Carter Electric Company for service.

This is an organization whose members are trained to meet the demands of any emergency and this organization is ready to serve you on an instant's notice.

If your requirements cover Rubber Conduit Wire, Switches, Safety Switches, Wiring Devices, Fuses, Lamps or other electric supplies, it is only a matter of a few hours before we can place them in your hands.

This is because our warehouses are always fully stocked—everything you may need and in large quantities—and with every modern facility for handling your business the Carter Electric Company pledges you **Unfailing Service.**

Carter Electric Company

63 Peachtree Street, Atlanta

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable paper binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

SOUTHERN BUSINESS DIRECTORY

COTTON, WASTE, LINTERS, Etc

E. A. CUTTS C. S. CUTTS, SR.

E. A. CUTTS COMPANY
Cable Address: "CUTTS"
COTTON BROKERS
30 Bay Street, East
Savannah, Ga.
Office Phones—478—2713—Postal Phone
Long Distance—0929
Branch Office: E. A. CUTTS & SON, Augusta, Ga.

SUPPLIES, MISC.

STENCILS — METAL CHECKS — RUBBER STAMPS

Send for Catalogue
Stencil Work for Cotton Mills Our Specialty

SOUTHERN STAMP & STENCIL CO.

7 W. Mitchell St.
ATLANTA
GA.

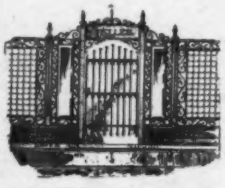
WELDING & REPAIRS

SOUTHERN WELDING & MACHINE CO.
190 COURTLAND STREET ATLANTA, GA.
Gear Cutting and Machine Work.
No job too large or too small for us.
We specialize in cotton mill and oil mill welding and machine work.
Oxy-Acetylene and Electric Welding

Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

CONSTRUCTION

Cast Iron Columns
FOR
COTTON MILL CONSTRUCTION
American Cast Iron Pipe Company
COLUMN DEPARTMENT BIRMINGHAM, ALA.
NEW YORK OFFICE: 261 BROADWAY



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St., Baltimore, Md.

PLUMBING and HEATING
POWER & HAND PUMPS DAIRY SUPPLIES
PROMPT SERVICE.
HACKNEY BROTHERS CO.
No. 6 West 5th St., Charlotte, N. C.

J. E. ROBBINS & SONS
PRACTICAL WELL DRILLERS
208 W. Coffee St.
P. O. Box 87 Phone: Long Distance 2985
Greenville, S. C.

R. L. GOODE
GENERAL CONTRACTOR
Charlotte, N. C.

GUDE & CO., Builders
CANDLER BLDG., - ATLANTA, GA.
All classes of buildings constructed promptly and efficiently and at reasonable prices.

established 1865

WELLS
HUGHES SPECIALTY
WELL DRILLING CO.
CHARLESTON ATLANTA

Commission Merchants, Yarn Dealers, Cotton Dealers, and Brokers, Etc.

H. Ray Paige, Pres. J. A. Mandeville, Vice-Pres. J. H. Schoolfield, Secy. and Treas.

Southern Cotton Yarn Co., Inc.

1 Madison Avenue, New York City

SELLING AGENTS FOR

SOUTHERN MILLS

Carded—Combed Yarns

4's TO 120's SINGLE AND PLY

Selling Direct to Consumer.
NEW ACCOUNTS SOLICITED.

The Recognized Standards of Quality

COTTON YARNS

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness, and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

36s to 80s Single and Ply Combed Peeler Right Twist. 36s to 50s Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
131 East 23d Street,
New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone: Gramercy 812
New England Representative
H. D. Skinner,
212 Summer St. Boston, Mass.

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

1865 The Oldest National Bank in the Cotton States 1920

Business Building by Centuries

"Makers of fine footwear since the days of George III;" "Unrivaled for fifty years;" "This corporation has granted insurances for two hundred years;" "Known for upward of a century;" "Founded 1815."

In the Heart of Atlanta—
The Heart of the South.

These are random phrases from advertisements in a recent trade supplement of The London Times.

We lay stress on age in American business. A recent inquiry as to how many American business houses could look back on a century of service, yielded an incomplete list of but 58.

Yet AGE IS AN ASSET. It is a promise of FAIR DEALING. A HISTORY OF HONESTY.

The First National Bank of Philadelphia established in 1863, is the oldest national bank in the United States. The Atlanta National Bank, established just two years later in 1865, when Atlanta was in ashes, is the oldest national bank in the Cotton States.

Fifty years of scrupulous care in guarding the interests of every depositor, has made the Atlanta National Bank not only a wonderful successful business institution, but is an assurance that it will contine to be a REAL AND VITAL PART OF THE GREAT THROBBING COMMERCIAL LIFE OF THE SOUTHEAST.

Atlanta National Bank

OFFICERS

ROBERT F. MADDOX, President.

Vice-Presidents

JAS. S. FLOYD GEO. R. DONOVAN THOS. J. PEEPLES

Assistant Cashiers

D. B. DeSAUSSURE R. B. CUNNINGHAM

J. F. ALEXANDER LEO. STILLMAN

J. S. KENNEDY, Cashier

IF YOU NEED BANKING SERVICE

in the South,
and especially in Georgia

You need The Citizens & Southern

Capital and Surplus $4,500,000

The Citizens & Southern system has completely equipped offices in Atlanta, Savannah, Macon and Augusta.

Each of these offices is connected with the others by direct private wires.

If you are a customer of either office, and want information or service of any kind from the other cities these wires and the complete organization are at your service.

Hundreds of direct correspondents all over the south makes it possible to give you practically the same service wherever you want it.

The Citizens & Southern Bank

Atlanta—Marietta at Broad

Savannah Macon Augusta

"No account too large, none too small"

NATIONAL BANK OF COMMERCE 1839 IN NEW YORK

A Service of Facts

Through contact with every phase of big business, and as a result of the exhaustive and constant study of economic conditions which is essential to the safe conduct of a great bank, the National Bank of Commerce in New York is able to render to its friends a peculiarly valuable service.

Broadly speaking, we are in a position to supply authoritative information, drawn from original sources, on practically every important matter related to commerce and industry, whether national or international.

Our friends, in this sensitive period of adjustment, are invited to employ this service to the fullest extent.

National Bank of Commerce in New York

Capital, Surplus and Undivided Profits
Over Fifty-five Million Dollars

Factors

TEXTILE BANKING COMPANY
INCORPORATED
50 Union Square New York
Inaugurated by GUARANTY TRUST COMPANY OF NEW YORK
and LIBERTY NATIONAL BANK OF NEW YORK

Hunter Manufacturing & Comm. Co.

58-60 Worth St.

NEW YORK CITY U. S. A.

WORLD-WIDE DISTRIBUTOR OF COTTON FABRICS

COTTON FABRICS FOR HOME AND EXPORT

DOMESTIC BRANCH OFFICES

Boston Chicago San Francisco
Philadelphia St. Louis
Baltimore Greensboro

FOREIGN BRANCH OFFICES

Buenos Aires, Argentine Curacao, D. W. I. Caracas, Venezuela
Santiago, Chile
San Juan, Porto Rico Havana, Cuba Barranquilla, Columbia

WEIMAR BROTHERS

MANUFACTURERS OF

TAPES, BINDINGS AND NARROW FABRICS

2046-48 Amber Street,

PHILADELPHIA

J. H. LANE & CO.

INCORPORATED

NEW YORK

Selling Agents for

Cotton Mill Products

BOSTON CHICAGO

WOODWARD, BALDWIN & CO.

43 and 45 Worth Street, New York

Selling Agents for

SOUTHERN COTTON MILLS

Manufacturing Well Known Brands of

SHEETINGS
DRILLS
DIAPER CLOTH

SHIRTINGS
DUCKS
TOWELS

For Home and Export

ALL WEIGHTS AND CONSTRUCTIONS OF PRINT CLOTHS AND FINE CLOTHS IN PLAIN AND FANCY WEAVES

Outing Flannel and Romper Cloths
Towels and Diaper Cloths

Baltimore
St. Louis
St. Joseph

Philadelphia
San Francisco

Boston
Chicago
Shanghai, China

Tolar, Hart & Holt Mills

Fayetteville, N. C.

Hosiery Yarns 20s to 30s on cones

TOLAR & HART

New York and Philadelphia

Selling Agents

BLISS, FABYAN & CO.

NEW YORK BOSTON CHICAGO

Selling Agents for

Androscoggin Mills
Bates Mfg. Co.
Boston Duck Co.
Columbian Mfg. Co.
Cordis Mills.
Edwards Mfg. Co.
Hill Manufacturing Co.
Otis Company
Palmer Mill
Pepperell Mfg. Co.
Thorndike Company
Warren Cotton Mills.

Otis Company—Underwear

WILLIAM L. BARRELL CO.

BOSTON
NEW YORK

8 Thomas St.
NEW YORK

CHICAGO
SAN FRANCISCO

COTTON DUCK

WIDE
SAIL
ARMY

SINGLE FILLING
DOUBLE FILLING
ENAMELING

J. SPENCER TURNER CO.

56 WORTH STREET, NEW YORK

COTTON DUCK

ARMY—SAIL—WIDE

"LOWELL" TIRE FABRICS-SPECIAL DUCK

CRASHES—TWILLS—DRILLS—SATTEENS

ROPE—TWINE

COTTON YARNS

ESPECIAL ATTENTION GIVEN TO EXPORT REQUIREMENTS

CHICAGO
208 So. LaSalle St.

PHILADELPHIA
M. & M. Building

BOSTON
161 Devonshire Street

HAMILTON, CANADA.
J. Spencer Turner Co. of Canada, Limited

1866 1920

THE PUTNAM-HOOKER COMPANY, Inc.

87 and 89 Leonard Street

NEW YORK CITY

BRANCH OFFICES

CINCINNATI **CHICAGO** **ST. LOUIS**

SELLING AGENTS SOUTHERN COTTON GOODS

Amoskeag Manufacturing Co.

34 Thomas Street, New York

27" and 32" GINGHAMS:—A F C, Utility, Three Star, Seersuckers, Staple, Bookfold Chambray, Maybourne Madras.

32" CHAMBRAYS:—19000 Range, Maybourne Madras, Invincible Suiting, Romper Cloth.

NARROW FLANNELS, FANCY:—1921, Smyrna, PLAIN,:—Daisy Fleecedown, Iris, Tunis, 1921, Panola, Trinada, Ponceta, Tacuna, Pamela.

32" SHIRTING FLANNELS:—2701, 2801.

36" FLANNELS, FANCY:—1701, 1501, 1301, 1101, PLAIN:—Daisy, Fleecedown, Domet, 1501, 1101, 901.

TICKINGS, DENIMS, OLIVE DRAB TWILL, BLEACHED GOODS, GREY GOODS, SEAMLESS BAGS, TOWELING.

WORSTED GOODS:—Serges, Vigereaux, Poplins, Panamas.

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT

J. WILLIAM BARKDULL C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange

New Orleans Future Brokers Association

New York Stock Exchange

New York Cotton Exchange

New York Coffee Exchange

New York Produce Exchange

Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK

Perhaps we can give you the information

The superintendent of a mill wanted a lot of special corrugated paper boxes. We told him where he could get them.

Another superintendent wanted information as to where he might obtain some 2,000 horsepower of boilers. We gave him the names of several possible sources of supply.

So it goes. This service is free to readers of COTTON. We are always glad to be of assistance in filling your wants. Our files contain the names of manufacturers and dealers in every article or supply you can possibly want.

Let us help you find the things you need. Look first through the advertising pages of COTTON, then if what you want is not advertised write us.

We promise to give you immediate service. We know that we can be of assistance to you.

Cotton, Grant Bldg., Atlanta

THE AMERICAN AUDIT COMPANY

100 BROADWAY, NEW YORK CITY

F. W. LAFRENTZ, C. P. A., President.

H. M. RICE, C. P. A. Vice Pres. A. F. LAFRENTZ, Secy. & Treas.

BRANCHES:

New York	Chicago	Atlanta	Boston
Richmond	Baltimore	New Orleans	Philadelphia
Washington, D. C.	Milwaukee	Scranton	London, E. C.

Our Reports of Audit and Our Certificates of Condition and Operations, Are Known and Have Weight in the Financial Centers of the World

ATLANTA BRANCH

1013 Fourth National Bank Building, Atlanta, Ga.

C. B. BIDWELL, C. P. A., Resident Vice President.

SOUTHERN RAILWAY SYSTEM

Eight Trains a Day Atlanta to Macon

Leave Atlanta	7:50 am.	12:05 pm.	12:20 pm.	5:00 pm	8:00 pm.	9:30 am.	10:50 pm.	12:05 am.
Arrive Macon	10:59 am.	2:35 pm.	3:00 pm.	8:10	9:35 am.	12:00 m.	1:30 am.	2:30 am.

Six Trains a Day Atlanta to Jacksonville

Leave Atlanta	(C. T.) 7:50 am.	12:05 pm.	8:00 pm.	9:30 pm.	10:50 pm.	12:05 am.
Arrive Jacksonville	(E. T.) 10:25 pm.	11:30 pm.	8:15 am.	8:35 am.	10:50 am.	11:50 am.

Four Trains a Day Atlanta to Birmingham

Leave Atlanta	6:00 am.	11:30 am.	4:30 pm.	11:00 pm.
Arrive Birmingham	12:10 pm.	5:40 pm.	10:30 pm.	5:30 am.

Three Trains a Day from Atlanta to Cincinnati

Leave Atlanta	5:35 am.	6:10 am.	4:35 pm.
Arrive Cincinnati	9:15 pm.	9:50 pm.	8:10 am.

"THE SOUTHERN SERVES THE SOUTH"

V. L. ESTES

District Passenger Agent

Grant Building Atlanta, Ga.

CLASSIFIED ADVERTISING

Positions Wanted

OVERSEER OF BLEACHING wants position. Age 42. Twenty years experience in bleaching all kinds of cotton piece goods, drills, twills, corsets, duck and all kinds of sheetings, narrow and wide. Best of references. Write Box 28 care of COTTON, Atlanta, Ga.

Wanted—Salesmen.

Salesmen calling on the textile mills, and interested in new lines of machinery, paints, building supplies or chemicals, either as a side line or exclusively will find it profitable to write, giving experience, territory covered and other details. Correspondence strictly confidential. Cotton, 1021 Grant Building, Atlanta, Ga.

Have you any proposition to put before the executives in the textile mills of the South? Anything to sell or buy that they may want or have? Do you want a better position or do you want a good man to fill a position?

Whatever your message, this "Classified Opportunities" section of COTTON is the logical place for the announcement of your requirements.

It's the meeting place for Employer and Employee, and a good salesman in print for anything you want to dispose of.

A little ad won't cost much. Try it for a month or so.

RATES:

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four word, for box address,)

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

Miscellaneous

Your Next Cash Book

The UNIVERSAL CASH BOOK is not only the most modern, original and simple Cash Book yet devised—but the finest money can buy. Write for circular No. 42.

UNIVERSAL SYSTEM, INCORPORATED.
608 So. Dearborn St.
CHICAGO

For Sale

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

FOR SALE

1—11x4½Hetherington Slubber, 48 spindles, price, **$480.** 1—10 x5 Lowell Slubber 1907 model, 80 spindles, **$800.** 1—9x4½ Hetherington Int. Speeder, 96 spindles, **$480.** 2—10x5 Providence Int. Speeders, 102 spindles each, **$10** per spindle. 1—44" C & M Cloth Brusher, **$350.** 1—16 spindle, Lowell Camless Winders, cone and tube attachments, practically new, **$600.** 2—Hopedale dale Twisters, 3½" ga. 2½" ring, 136 spindles each at **$5** per spindle. 1—10x14 Monarch Lathe, hollow, spindle, practically new, comp'ete with tape attachment, **$550.** 2—Whitin Gear Cutters, hand power feed, **$300** each. 4—40" Saco Pettee Cards, 27" doffer, 12" coil, 110 flats, **$1,000** each. 16—40" Pettee Cards, 26" doffer, 10" or 12" coil, 106 flats, **$900** each. 1—60" two- cylinder Garnett Machine complete, price **$3,000.00.** 1—90-foot Tentering machine adjustable to 50 inch, clamp type, price **$2,100.00.**

Atlanta Textile Machinery Co.

Tel. Ivy 5706 ATLANTA GA. 804 Austell Bldg.

We Offer the Following Subject to Being Unsold —WHAT HAVE YOU TO SELL?

PICKERS

3—40″ H & B Finisher Lappers
1—40″ Woonsocket machine and Press Intermediate Picker
1—Dodge Jute Picker with bit feed
1—Waste Picker
1—48″ Wool Picker
1—30″ Burr Picker

CARDS

4—Saco Pettee Cards 110 Flatts 12″ Coil
16—40″ Pettee Cards 110 Flatts 12″ Coil
4—40″ Herthington Cards
4—40″ Platt Cards
18—37″ H & B Cards
10—36″ Roller Cards
24—40″ Gordon & Hayes Card Attachment
1—40″ William Firth Card Stripper NEW
24—Bramwell Feeds
25—Camble Backs
24—48″Doffer Combs for Waste Cards
24—Feed Rollers
1—60″ First Breaker Wool Card

DRAWING FRAMES

20—Head Saco Pettee Evener Drawings
24—Deliveries Saco Pettee Drawings 12″ coil, metallic rolls
75—Deliveries Whitin Drawings 12″ Coil
50—Deliveries Whitin Drawings 10″ Coil. Metallic Rolls Leather rolls
18—Head Whitin Drawing, 4 deliveries each, 12″ coil, metallic rolls

SLUBBERS

1—12x6 Providence Slubber, 64 spindles
1—10x4¾ Providence Slubber, 52 spindles
1—12x6 H & B Slubber, 56 spindles
2—12x6 Saco Water Power Slubbers, 60 spindles each
1—10x5 Lowell Slubber, 80 spindles
3—11x5½ Saco Water Power Slubbers, 60 spindles each

INTERMEDIATES

1—12x5 Herthington Intermediate, 80 spindles
8—8x4½ Providence Intermediate 76 spindles
1—10x5 H & B Intermediate, 108 spindles
2—10x5 Providence, 102 spindles each

SPEEDERS

5—7x3½ Saco Pettee Speeders, 152 spindles each
1—8x3½ H & B Speeder, 152 spindles
5—8x4 Providence Speeders, 104 spindles each, prompt delivery
125—8x4 H & B Speeders Spindles
148—8x4 H & B Fivers
5—7x3½ Saco Pettee 152 spindles each

SPINNING

2—Saco Water Power Filling Frames, 208 spindles each
4—Fales & Jenckes 204 spindles each, 1½″ ring, 2¾″ gauge
25—F & J Ring Spinning frames, 3″ gauge 1 to 2″ ring

SPOOLERS

1—4x6 E & B Spooler 80 spindles gravity
1—4x6 E & B Spooler 100 spindles gravity
1—4x6 E & B Spooler 120 spindles gravity
1—4x6 Saco-Lowell Spooler, 120 spindles gravity
1—4x6 E & B Skein Spooler, 48 spindles

TWISTERS

2—Hopedale Twisters, 128 spindles each, 2½″ ring, 3¼″ gauge
2—Fales & Jenakes Twisters, 128 spindles, 3″ ring, 4″ gauge, reels for 4 ply
2—24 spindles G. & Bramwell Twisters, 4″ ring
2162 spindle Boyd Twisters, 3″ ring, 4″ gauge, 8″ traverse
2—220 spindle H & B 2¼″ vertical ring, 3¼″gauge, gravity spindles, knee-brake
3—128 spindle Whitin Twister, 4″ gauge, 3″ ring

REELS

8—Lindsey Hyde Reels, 54″ to 72″, adjustable swift
2—50 spindle Lowell Reels with live spindles
4—50 spindle Tompkins with adjustable swifts

WINDERS

22—Gangs No. 50 Universal Tube Winders, doubling attachment
4—No. 50 Universal Cone Winders with doubling attachment
12—No. 50 Universal winders with cone attachment
2—No. 30 Foster winders with cone, tube and skein attachment, 100 spindles
1—Collins Skein winder, 56 spindles
1—George W. Payne Quill Re-Winder

WARPERS

2—Intristle Beam Warpers with balling attachment
2—Hopedale Beam Warpers
1—Globe Den Warper

SLASHERS

1—6x4 H & B Slasher with size kettle
1—2-cylinder Standard Cohoes Slasher

LOOMS

1—50 LOOM COMPLETE WEAVING PLANT
100—Model ″ 30″ Draper Looms
160—Model ″A″ Draper 40″ Looms, 24 bobbin magazine
300—Model ″A″ 36″ Draper Looms, 24 bobbin magazine
10—Model ″E″ 36″ Draper Looms, 28 bobbin magazine
40—82″ Crompton & Knowles Looms
40—92″ Crompton & Knowles Looms
19—32″-34″ Reed Space, plain Whitin Looms
328—16 Harness index dobby heads
15,000—Steel Heddle eyes NEW

CLOTH ROOM MACHINERY

1—42″ Curtis & Marble Cloth Folder
1—40″ Curtis & Marble Folder
1—44″ Curtis & Marble Cloth Brusher
1—44″ Lowell Cloth Folder
1—40″ Lowell Cloth Brusher

KNITTING MACHINERY

2—COMPLETE KNITTING MILLS FOR SALE
1—260 Needle Machine
18—220 Needle Geo. D. Mayo Machines
5—220 Needle Scott & Williams Machines
1—18 point steady dial looper with trimmer
15—176 needle Jenckes Invisible knitting machines
12—176 needle Acme machines
2—Wright steady dial loopers, 16 points
11—220 needle Standard ″F″ knitting machines
5—170 Needle Scott & Williams Model ″F″ machines
5—170 Needle Scott & Williams Model ″G″ machines
50—220 Needle Acme & Mayo machines
20—176 Needle Scott & Williams Model ″M″ machines
25—Brinton Ribbers two end stationary stop motions NEW
2—14 point Hepworth Loopers
2—96 Needle Acme Knitters
5—140 Needle Acme Knitters
4—108 Needle Acme Knitters

DRYERS

1—60′ Dryer, 800 to 1,000 pounds capacity per hour
1—Vacuum Dyeing Machine
1—Sargent Dryer
1—48″ Broadbent Steam Extractor

PRESSES

1—Single Knuckle Joint Press 100 ton capacity
1—Hand Power Baling Press, 500 lbs. capacity
1—Hydraulic Press with all equipments
1—48x33 Steam Hosiery Press
2—Daisy Yarn Presses.
2—Eccles Cloth Presses

LATHES AND DRILL PRESSES

1—18x10 Carey Lathe
1—18x10x6 RAHN-MAYER CARPENTER LATHE
1—10x10 Lucius W. Pond Lathe
1—4x8 Lucius W. Pond Lathe
1—8x9 Reid Lathe
1—16″ Silver Drill Press
1—14″ Drill Press
1—18x14x6 American Gap Bed Engine Lathe
1—20″ Champion Plain Wheel and Lever Feed Drill Press
2—1¼ Knight Milling and Drilling Machines

MISCELLANEOUS

1—D. E. WHITON Semi-Automatic Gear Cutting Machine complete
2—36″ Spike Aprons for Feeders, NEW
2—36″ Carrier Aprons for Finishers
2—36″ Carrier Aprons for Breakers
5,000 Steel Electric Light Reflectors
10,000 Whitin Gravity Medium Spindles
12,000 McMullen Spindles
25,000 Draper No. 2 Spindles
5,000 Draper No. 4 Spindles
600—2″ Spinning rings with plate holders
2000—1¾″ spinning rings with plate holders
1,200—4½″ vertical twister rings
1,343—4″ vertical twister rings
15,000—Draper No 2 Warp Bobbins
40,000—Medium Whitin Bobbins
20,000—Draper No. 4 Quills, metal base
2,000—Rewinder quills for heavy work
200,000—Draper No. 2 Quills 3-ring
20,000—Warp Twister Bobbins rock maple
5,000—3½x6 wood head spools
2,000—3x6 two head twister bobbins
20,000—Warp Bobbins for McMullen spindles
8,000—Filling Twister Bobbins for D-95 spindles
2,000—Warp Twister bobbins for D-95 spindle
20,000—Whitin Quiller Quiller Quills
3,000—2-ring Draper No. 2 filling quills
25,000—7″ Speeder bobbins with steel ring
18,000—7″ Roving Skewer
1—Double Former Todd Rope machine
1—Laundry Dyeing machine
1—60 K W West Electric Direct Connected Generator
1—182x29″ three ply belt
1—6,500 SPINDLE WHITIN EQUIPMENT
1—1,500 SPINDLE EQUIPMENT
1—2,000 Spindle Coarse Yarn Equipment

C. L. UPCHURCH—*TEXTILE MACHINERY*

P. O. Box 1411 Phone: Ivy 5706

804 AUSTELL BUILDING ATLANTA, GA.

Buyers' Index

Acetylene Welding Apparatus.
(See Welding Apparatus).

Acetylene Gas.
Commercial Acetylene Supply Co.
Southern Welding & Mach. Co.
Standard Gas Products Co.

Accountants.
(See Auditors and Accountants).

Adding Machines.
Monroe Calculating Mch. Co.

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
(See Humidifying Apparatus).

Albone.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals).

Aniline Colors.
(See Dystuffs and Chemicals).

Anti-Chlornie.
(See Dyestuffs and Chemicals).

Aprons-Rub.
Ladew & Co., Inc., Edw. R.
Smith & Furbush Machine Co.
Graton & Knight Mfg. Co.

Architects and Engineers.
American City Eng'g Co.
Dowman, George.
Draper, E. S.
Ferguson Co., John W.
Industrial Welfare Builders.
Lockwood, Greene & Co.
Robert & Co.
Spiker & Lose.
Sirrine, J. E.
Thompson & Binger, Inc.

Ash Handling Machinery.
(See Coal Handling Machinery).

Asphalt Slate Shingles.
(See Slate Asphalt Roofing).

Auditors and Accountants.
American Audit Co.
Ernst & Ernst.
Gregory & Gregory, Walter.

Auto Trucks.
(See Trucks—Auto).

Automatic Controllers (Temperature).
(See Temperature Controllers.)

Automatic Loom Attachments.
(See Loom Attachments).

Automatic Feeds for Cotton.
Hopedale Mfg. Co.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

Automatic Guider (Electric).
Blake Elec. Co.

Backwashers.
Sargent's Sons Corp., C. G.

Automatic Scales.
(See Scales).

Ball Bearings.
Aldrich Mch. Works.
Campbell Mfg. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
S K F Industries.
U. S. Ball Bearing Co.

Ball Bearing Housings.
Aldrich Mch. Works.
Fafnir Bearing Co.

Ball Bearing Top Rolls.
Campbell Mfg. Co.

Bale Band Buckles.
(See Box Strapping & Buckles).

Bale and Box Ties.
Lovingood Co.
Regnas Co., J. R.
Signode System, Inc.

Baling Machines.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Garland-Henning Mfg. Co.
Williams & Sons, I. B.
Hulme, J. S.
Saco-Lowell Shops.

Baling Presses.
(See Presses).

Bandages, Tapes, Etc.
American Textile Banding Co.

Bands.
(See Tapes).

Banding Straps and Buckles.
Lovingood Co.
Regnas Co., J. R.
Signode System, Inc.

Bands (Self-Tying).
Campbell Mfg. Co.

Banks.
Atlanta National Bank.
Citizens & Southern Bank.
Irving National Bank.
National Bank of Commerce In New York.
National Shawmut Bank.
Textile Banking Co., Inc.

Bars (Corrugated for Concrete Reinforcement).
Corrugated Bar Co.

Barometers (Mercurial).
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Barrels—Fibre.
(See Fibre Products).

Baskets—Mill.
(See Boxes—Mill).

Bath Cabinet—Shower.
Shower Bath Cabinet Co.

Batteries (Elec.).
(See Storage Batteries).

Beam Dyeing Machines.
Cocker Mchry. & Foundry Co.

Beam Heads (Steel).
Mossberg Co., Frank.

Beaming and Warping Mchry.
(See Warpers and Warping Machinery).

Bearings.
Chicago Pulley & Shafting Co.
Creason-Morris Co.
Diamond State Fibre Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Standard Pressed Steel Co.
S K F Industries.
U. S. Ball Bearing Co.
Valley Iron Works.

Belting.
American Supply Co.
Augusta Mill Supply Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Russell Mfg. Co.
U. S. Rubber Co.
Walraven Co.
Williams & Co., I. B.

Belting—Chain Link.
Link-Belt Company.
Morse Chain Co.

Belting—Rope.
(See Rope Transmission).

Belt Conveyors.
Link-Belt Company.
Morse Chain Co.
Portable Machinery Co.

Belt Dressing.
Jos. Dixon Crucible Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Walraven Co.
Williams & Co., I. B.

Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.

Belt Hooks.
Crescent Belt Fastener Co.

Belt Lacing.
Augusta Mill Supply Co.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Walraven Co.

Belt Rivets.
Crescent Belt Fastener Co.

Belt Tighteners.
Link-Belt Company.
Williams & Sons, I. B.

Benches (Park and Playground).
(See Playground Equipment).

Billiard Tables, Etc.
Brunswick-Balke-Collender Co.

Bleacheries.
(See Dyers, Bleachers and Finishers).

Bleaching Kiers.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machinery Co., The.

Bleaching Machinery.
(See Dyeing, Bleaching and Finishing Machinery).

Bleaching, Finishing and Sizing Materials.
(See Finishing Materials).

Blowers and Blower Systems.
American Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
General Electric Co.
Perkins & Son, B. F.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Fibre.
Diamond State Fibre Co.

Boards—Form.
Pearson, Jos. T.

Bobbins.
Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

Boilers.
International Engineering Works, Inc.
Jones Machinery Corp.
Lombard Iron Works & Supply Co.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Boiler Feed Water Purification.
American Water Softener Co.
Borromite Co. of America.
Hulme, J. S.
Permutit Co.
Refinite Co.
Scaife & Sons, Wm. B.

Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.

Boiler Grates and Stokers.
(See Grates and Stokers).

Boiler Graphite.
Jos. Dixon Crucible Co.

Bookkeeping Machines.
Monroe Calculating Mch. Co.

Box Strapping and Tie Buckles.
(See Banding Straps & Buckles).

Boxes—Mill.
Diamond State Fibre Co.
Hightower Box & Tank Co.
Keystone Fibre Co.
Lane & Bros., W. T.
Rogers Fibre Co.
Standard Fibre Co.

Boxes—Packing.
(See Packing Boxes).

Bowling Alleys, Etc.
Brunswick-Balke-Collender Co.

Braid.
(See Tapes).

Brake Linings.
Diamond State Fibre Co.

Brazing.
(See Welding).

Brokers—Cotton.
(See Cotton Dealers & Brokers).

Brokers—Stock.
(See Stocks and Bonds).

Brooms.
(See Brushes.

Brushes—Mill.
Atlanta Brush Co.
Southern Brush & Broom Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets and Pails—Mill.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

Building Contractors.
(See Contractors).

Buildings—Portable.
Dowman, George.
Lockwood, Greene & Co.

Building Material.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Barrett Co., The.
Birmingham Slag Co.
Corrugated Bar Co.
Detroit Steel Products Co.
Dowman, George.
Dufur & Co.
Kirkpatrick Lumber & Timber Co.
Lockwood, Green & Co,
Southern Cypress Mfg. Asso.

Bungalows.
(See Houses—Ready Built).

Burr Pickers.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

Bushings.
Diamond State Fibre Co.
Southern Spindle & Flyer Co.

Cabinets.
(See Lockers).

Calculating Machines.
Monroe Calculating Mch. Co.

Calenders.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co.

Calender Rolls.
Campbell Mfg. Co.
Butterworth & Sons Co., H. W.
Roy & Son, B. S.
Perkins & Son, Inc., B. F.
Textile Finishing Machinery Co.

Calling System—Inter-Telephone.
Carter Electric Co.

Cans—Roving.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Canvas Lugs.
Augusta Mill Supply Co.

Cars and Trucks—Fibre.
(See Trucks).

Car Unloaders.
Portable Machinery Co.

Carbonizing Machines.
Cocker Mch. & Fdry Co.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Salem Iron Wks.
Sargent's Sons & Co., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Mch. Wks.

Carding Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Clothing.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Factory, Warehouse and Office Receptacles

TAPER BASKETS
WASTE BASKETS
OVAL CANS
GILL CANS
BARRELS

Get the FACTS
CONCERNING
Our NEW TYPE
Trucks and Boxes

YOUR NEXT ORDER SHOULD SPECIFY "CONTINUOUS ANGLE AND BOTTOM CORNER CONSTRUCTION;" SENDING SAME TO THE

STANDARD FIBRE CO.
MILLER STREET SOMERVILLE, MASSACHUSETTS

No-Waste
SEAMLESS ROVING CANS

IN SIX DIFFERENT DIAMETERS
AND
FOUR STYLES OF TOP RIM.

Ask The Man Who Hasn't One

COTTON is a member of the Audit Bureau of Circulations.

Do you understand what that means to you as an advertiser?

It means that you get a "square deal" when you buy our circulation. It means that the net paid distribution of COTTON has been verified by the only recognized authority on circulation.

It means all that and more. It means that our circulation is "above board." We have nothing to conceal.

Facts are given in detail in the A. B. C. statements. COTTON gladly furnishes them on request. Every publication with nothing to hide can do the same.

So, ask the man who hasn't one—why?

HOTEL Sinton
CINCINNATI

THE courtesy of the Hotel Sinton's personnel and the fine cuisine of this modern hostelry are points of note among commercial travelers and tourists.

THE HOTEL SINTON offers extensive accommodations. A fine, new 300-room wing is to be completed July 20, 1920.

Cincinnati's Leading Hotel
700 Rooms, all with Bath or Shower.

Management
JOHN L. HORGAN

BUYERS' INDEX—Continued.

Card Grinding Machinery.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Carpet Machinery.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Wks.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Carrier Aprons.
(See Aprons).

Cases—Wooden.
(See Boxes).

Casement Window Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.

Castings.
American Cast Iron Pipe Co.
Cresson-Morris Co.
Lombard Foundry & Mch. Co.
Valley Iron Works.
Walsh & Weidner Boiler Co.

Cast Iron Columns.
American Cast Iron Pipe Co.

Caustic Soda.
(See Bleaching Materials).

Cement Machinery.
Allis-Chalmers Mfg. Co.

Cement Reinforcement.
Birmingham Slag Co.
Corrugated Bar Co.

Cement and Brick Coating.
Cooledge & Sons, F. J.
Dixon Crucible Co., Jos.
Peaslee-Gaulbert Co., Inc.
Patterson-Sargent Co.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

Centrifugals.
Cresson-Morris Co.
Tolhurst Mch. Wks.

Chain Drives.
(See Belting—Chain Link).

Chain—Block, Bicycle, Auto, Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools.
Pick & Sons, Albert.
Reischmann Co.
Sani Products Co.
Wright Co.

Chemicals.
(See Dyestuffs and Chemicals).

Chlorine Gas.
Electro Bleaching Gas Co.

Cleaning Machine—Suction.
United Electric Co.

Clocks—Hank, Etc.
(See Counters).

Clocks—Time.
Eco Clock Co.

Clocks—Watchman.
Eco Clock Co.
Chicago Watchman Clock Co.
Dixie Electric Equip. Co.

Closets—Water.
(See Toilets).

Cloth Cutters.
Firsching, J. A.
Wildman Mfg. Co.

Cloth Guider (Electric).
Blake Elec.

Cloth Room Machinery.
Butterworth, H. W., & Sons Co.
Firschine, J. A.
Saco-Lowell Shops.
Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.

Cloth Shrinking Machinery.
Reliance Machine Works.
Tolhurst Mch. Wks.

Cloth Testers.
Scott & Co., Henry L.

Cloth Winders.
(See Winders).

Clutches—Friction.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.

Clutch Linings.
Diamond State Fibre Co.

Coal.
U. S. Fuel Corp.

Coal & Ash Handling Machienery.
Link-Belt Company.
Portable Machinery Co.

Coal Tar Disinfectants.
(See Disinfectants).

Cocks.
(See Valves).

Color Pails.
(See Buckets—Mill).

Color Testers.
Atlas Electric Devices Co.

Comb Aprons.
(See Aprons).

Commission Merchants & Dealers.
(See Cotton Cloth Commission Merchants).

Compressors—Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The.

Concrete Reinforcement.
Birmingham Slag Co.
Corrugated Bar Co.

Condensers.
Allis-Chalmers Mfg. Co.
Seeger Machine Tool Co.

Conduits.
Diamond State Fibre Co.

Condulets.
Crouse-Hinds Co.

Connectors—Frankel Solderless.
Westinghouse Elec. & Mfg. Co.

Consulting Engineers.
(See Architects and Engineers).

Contractors and Engineers—Building.
Aberthaw Construction Co.
American City Eng'g Co.
Dowman, George.
Ferguson Co., Jno. W.
Fonda Organization, The E. A.
Goode, R. L.
Gude & Co.
Robbins & Sons, J. E.
Spiker & Lose.
Thompson & Binger.

Contractors—Electrical.
(See Electrical Engineers.

Contractors—Painting.
Marshall Co., H. Newton.

Controlling Instruments—Temperature.
General Electric Co.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Conveyors—Belt.
(See Belt Conveyors).

Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
Hulme, J. S.
Link-Belt Co
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Portable Machinery Co.
Richards-Wilcox Mfg. Co.
Schofield, Wm. Co.
Standard Conveyor Co.
Seeger Machine Tool Co.
Walraven Co.
Valley Iron Works.

Conveyors—Portable.
Portable Machinery Co.

Coolers.
(See Humidifying Apparatus.)

Coolers—Water.
(See Water Coolers).

Cooling Towers.
(See Tanks and Towers).

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Corrugated Bars.
Corrugated Bar Co.

Cotton Yarn and Cloth Commission Merchants and Dealers.
Amoskeag Mfg. Co.
Barrell Co., Wm. L.
Bliss, Fabyan & Co.
Carver-Beaver Yarn Co., Inc.
Converse & Co.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Iselin & Co., Wm.
Lane & Co., J. H.
Putman Hooker Co.
Southern Cotton Yarn Co.
Tolar & Hart.
Turner Co., J. Spencer.
Weimar Bros.
Woodward Baldwin & Co.

Cotton Dealers and Brokers.
Beer, H. & B.
Outts, E. A.

Cotton Mill Machinery and Supplies.
Atlanta Textile Mchry. Co.
Augusta Mill Supply Co.
Barber-Colman Co.
Blake Electric Co.
Butterworth & Sons, H. W.
Cocker Mach. & Foundry Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Firsching, J. A.
Fletcher Works.
Greist Mfg. Co.
Greenville Spool & Mfg. Co.
Honedale Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mason Machine Works.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Slaughter Mchry. Co., G. G.
Smith & Furbush Mach. Co.
Southern Bending Co.
Stafford Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Fininshing Machinery Co.
Tolhurst Mch. Wks.
Universal Winding Co.
Unchurch, C. L.
Warp Compressing Mch. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Cotton Tape Loom.
Fletcher Works.
Honedale Mfg. Co.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers).

Counters—Revolution, Hank, Pick, Etc.
Precision Machine Co.

Counters—Restaurant.
(See Restaurant Equipment.)

Coupling—Shaft.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.

Covers—Rollers.
Diamond State Fibre Co.

Cranes.
(See Hoists).

Crayons.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.
Regnas & Co., J. R.

Creosote Oil and Creosoting.
Gulf States Creosoting Co.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cutters—Cloth.
(See Cloth Cutters).

Cypress Lumber.
Southern Cypress Mfg. Asso.

Cutters—Thread.
(See Thread Cutters).

Dairy Supplies.
Hackney Bros. Co.

Deep Wells and Supplies.
Hughes Specialty Well Drilling Co.

Dehumidifying.
Sturtevant Co., B. F.

Delivery Cases.
(See Boxes—Packing).

Dial Scales.
(See Scales).

Dies—Steel.
(See Stamps, Stencils, Etc.).

Discs—Fibre.
Diamond State Fibre Co.

Dishes and Glassware.
Chattanooga Queensware Co.
Pick & Sons, Albert.
Sani Products Co.
Wright Mfg. Co.

Disinfectants.
Barrett Co., The
Sanitas Co.

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Doffing Boxes—Mill.
(See Boxes—Mill).

Doffing Cars.
(See Cars).

Door Closers and Checks.
Richards-Wilcox Mfg. Co.

Door Hangers.
Dowman, George.
Richards-Wilcox Mfg. Co.

Door Mats—Steel.
Lovingood Co.
Regnas & Co., J. R.

Draft Gauges.
(See Gauges—Draft).

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Drills—Electric.
(See Electric Machinery).

Drinking Fountains.
(See Fountains—Drinking).

Drop Wires.
Greist Mfg. Co.
Steel Heddle Mfg. Co.

Drying Apparatus.
American Blower Co.
Sturtevant Co., B. F.

Drying Forms—Hosiery.
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

Dust Collectors.
(See Blowers and Blowing Systems).

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Processing Co.
King, Habersham.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Atlas Electric Devices Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Hulme, J. S.
Klauder-Weldon Dyeing Mch. Co.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Refinite Co.
Reliance Machine Works.
Rome Mch. & Fdry. Co.
Salem Iron Wks.
Schaum & Uhlinger.
Textile Finishing Machinery Co. The.
Tolhurst Machine Works.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Du Pont de Nemours & So., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway, Inc., Frank.
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sonneborn Sons, Inc., L.
Southern Distributing Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Electric Cleaning System—Suction.
United Electric Co.

Electric Conduit & Fittings.
National Metal Molding Co.

Ejectors.
Sherwood Mfg. Co.

Electric Dynamos and Motors.
See Motors and Generators).

Electric Fans.
(See Fans—Electric).

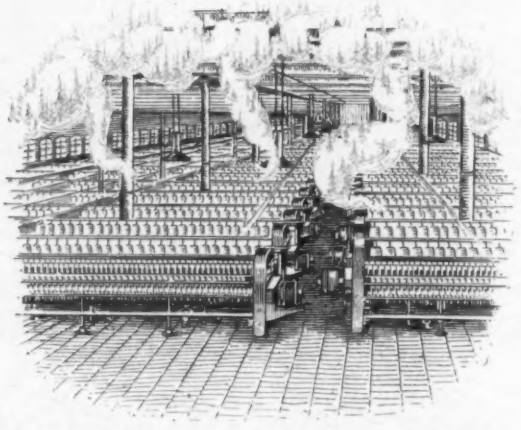
Electric Lamps.
(See Lamps).

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electrical Engineers and Contractors.
Dixie Electrical Equipment Co.
Huntington & Guerry, Inc.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Atlas Electric Devices Co.
Benjamin Electric Co.
Blake Electric Co.
Bryan Electric Co.

BRING THE HEALTHFUL ATMOSPHERE OF THE PINE FORESTS INTO YOUR MILL



There is direct relationship between the physical condition of your employees and your profits which can be measured in dollars and cents. Listless workers—absence here and there means but one thing—lower production. With lower production goes depleted profits.

Depleted profits from such causes are no longer excusable. Authorities tell us that much of the sickness and loss of vitality among factory workers is due to the constant breathing of impure air—a condition which can be remedied.

If you could transplant the pine forests right into your mill—if you could surround your workers with the healthful invigorating atmosphere that for centuries has made the pine forests famous—picture the result. And that is just what you can do through the use of SANITAS Humitas in your humidifying system at a cost of only a few cents a day.

SANITAS Humitas is not an ordinary pine oil or pine tar disinfectant. It contains in concentrated form chemical principles generated naturally in the pine forests and to which their hygienic influence is due. Employed regularly in your humidifying system it will impart an antiseptic fragrance to the air that will tend to increase the efficiency of your employees and add to their health and comfort.

SANITAS Humitas mixes readily with water and is especially prepared so that its continued use will not gum up humidifying heads.

We will be glad to tell you more about SANITAS Humitas.

TRY THIS TEST

Let us send a small sample of SANITAS Humitas without obligation to you. Pour a little in a tumbler of warm water and inhale deeply the vapors that arise. Note the stimulating effect. Then try out your present preparation in the same way and compare the difference.

THE SANITAS COMPANY

INCORPORATED

33 Keap St. Brooklyn, N. Y.

Southern Representative: H. D. WILKINSON
Box 233, Atlanta, Ga.

UNITED PRODUCTS

AMERICAN MADE — UCPC — PROMPT SHIPMENT

SULPHUR NAVY BLUE U. C. P.

The Best Money Value Colors

SULPHUR BLACKS JET OR BLUE SHADES

VELVETEEN

THE MOST EFFICIENT AND ECONOMICAL BOIL-OFF OR FINISH FOR RAW STOCK OR WARPS

United Chemical Products Corporation

Importers, Exporters and Manufacturers

York & Colgate Sts., Jersey City, N. J.

INQUIRIES SOLICITED

Southern Office, Realty Bldg., Charlotte, N. C.

Representatives :

R. T. GRANT, Charlotte, N. C.

BUYERS' INDEX—Continued.

Carter Electric Co.
Cooper-Hewitt Elec. Co.
Crouse-Hinds Co.
Cutter Works, George.
Dixie Electrical Equipment Co.
Economy Fuse & Fuse Co.
General Electric Co.
Hulme, J. S.
Jones Mchry. Corp.
National Metal Molding Co.
Seeger Machine Tool Co.
Slaughter Mchry. Co., G. G.
United Electric Co.
Walraven Co., The.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

Electrical Repairing—all kinds.
Bryan Electric Co.
Dixie Electrical Equipment Co.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec).

Elevators—Portable.
Collins, J. D.
Lovingood Co.

Elevators.
Link-Belt Company.
Seeger Machine Tool Co.
Standard Conveyor Co.

Enamel—Mill White.
(See Paint).

Engineers—Mill.
(See Architects).

Engines—Oil, Gas and Gasoline.
Seeger Machine Tool Co.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Engine Room Appliances and Supplies.
Crane Co.
Cutter Co., George.
Graton & Knight Mfg. Co.
Jenkins Bros.
Lunkenheimer Co.
Slaughter Mchry. Co., G. G.
Sherwood Mfg. Co.
Walraven Co.

Exporters—Cotton.
(See Brokers).

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems).

Fasteners—Belt.
(See Belt Fasteners).

Feed Water Purifiers.
(See Boiler Feed Water Purification).

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.

Fibre Products.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Filters—Water.
American Water Softener Co.
Borromite Co. of America.
Hulme, J. S.
Permutit Co.
Refinite Co.
Scaife & Sons Co., Wm. B.

Filters—Oil Removal.
Permutit Co.
Sherwood Mfg. Co.

Filters—Sand.
Permutit Co.

Finishing.
(See Dyers, Bleachers and Finishers).

Finishing, Bleaching and Sizing Materials.
Althouse Chemical Co.
Atlantic Dyestuff Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Corn Products Refining Co.
Dobbins Soap Mfg. Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
National Aniline & Chemical Co.
Newport Chemical Works.
Metz & Co., H. A.
Moore Oil Refining Co.
Roessler & Hasslacher Co.
Sonneborn Sons, Inc., L.
Southern Distributing Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.
Zavon Co., Inc.

Fire Alarm Apparatus.
Dixie Electric Equip. Co.

Fire Doors and Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.

Fire Hose.
(See Hose—Fire).

Fire Protecting Paint.
(See Paint).

First Aid Room Equipment.
(See Hospital Equipment).

Flexible Couplings.
Cresson-Morris Co.

Flood Lights—Electric.
Crouse-Hinds Co.
General Electric Co.

Flooring—Hardwood.
Kirkpatrick Lumber & Tim. Co.
Southern Cypress Mfg. Co.

Floor Scrubbing Machine.
American Scrubbing Equip. Co.

Floor Sweeps.
See Brushes.

Fluted Rolls.
Campbell Mfg. Co.
Howard & Bullough.
Perkins & Son, B. F.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Founders.
Cresson-Morris Co.
Lombard Fdry & Mch. Works.

Fountains—Drinking.
Crane Co.
Pure Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.

Friction Clutches.
(See Clutches—Friction).

Fuel.
(See Coal).

Fuses.
(See Elec. Mchy. and Supplies).

Garage Doors and Door Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.

Garnett Machines.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas).

Gaskets.
Diamond State Fibre Co.
Graton & Knight Mfg. Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauge—Oil.
Lunkenheimer Co.

Gauges—Pressure.
Tagliabue Mfg. Co., C. J.

Gauges—Recording.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Cutting and Cutters.
Cresson-Morris Co.
Southern Welding & Machine Co.
Whitin Machine Co., D. E.

Gear Pullers.
General Electric Co.
Greb Co., Inc.

Generators—Electric.
(See Motors and Generators).

Glassware and Dishes.
(See Dishes).

Governors—Pressure.
Tagliabue Mfg. Co., C. J.

Governors—Pump.
General Electric Co.
Tagliabue Mfg. Co., C. J.

Graphite Products.
Dixon Crucible Co., Jos.

Grates—Boiler.
International Eng. Works.
Lombard Fdry. & Mch. Co.

Grates—Mechanical.
(See Stokers).

Grease.
(See Lubricants).

Grease Cups.
(See Lubricators).

Green Houses.
Hulme, J. S.

Grindstones.
Richards-Wilcox Mfg. Co.

Grinders—Card, Cylinder, Roll, Napper and Garnet.
(See Card Grinding Machinery).

Guards—Electric Lamp.
Flexible Steel Lacing Co.

Guides—Thread.
Mitchell-Bissell Co.
Palmer Co., E. I.

Guider (Cloth-Electric.)
Blake Elec. Co.

Gums.
(See Finishing and Sizing Materials).

Guy Anchors.
Crouse-Hinds Co.

Gymnasium Apparatus.
Medart Mfg. Co., Fred.

Hangers.
(See Shafting and Hangers).

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hopedale Mfg. Co.
Southern Reeding Co.

Heads—Bobbin and Spool.
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus).

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hinges and Butts.
McKinney Mfg. Co.

Hoists.
Curtis Pneumatic Mchry. Co.
Hulme, J. S.
Link-Belt Company.
Morse Chain Co.
Seeger Machine Tool Co.
Walraven Co.

Hose—Fire.
Collins, J. D.
U. S. Rubber Co.

Hosiery Dyeing Machinery.
Cooker Mach. & Fdry. Co.
Rome Mach. & Fdry. Co.

Hosiery Finishing Boards.
(See Boards).

Hosiery Forms.
(See Drying Forms).

Hosiery Yarns.
(See Yarn Manufacturers).

Hospital Equipment.
Thomas Co., F. H.
Sani Products Co.
Wright Co.

Hotels.
Sinton.

Houses—Ready-Made.
Dowman, George.
Tuxbury Lumber Co.

Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

Humidity Indicating Instruments.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Hydraulic Turbines.
(See Turbines—Steam).

Hydro Extractors.
(See Extractors).

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments and Thermometers.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Indigo.
(See Dyestuffs and Chemicals).

Industrial Relationship Service.
Sherman Service, Inc.

Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.

Insulation—Vulcanized Fibre.
Diamond State Fibre Co.

Insurance.
Miller Indemnity Underwriters.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacks.
Paulus, Chas. B.

Jacquards.
Crompton & Knowles Loom Wks.

Jerker Straps.
Augusta Mill Supply Co.

Jute Bagging Machine.
Smith & Furbush Machine Co.

Kettles—Size.
(See Size Kettles).

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleacher Kiers).

Knit Goods Specialties.
Knit Goods Specialty Co.

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers).

Knit Goods Washers.
(See Washers—Cloth).

Knitting Machinery and Supplies.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Paulus, Chas. B.
Scott & Williams.
Wildman Mfg. Co.

Laboratory Instruments and Thermometers.
Tagliabue Mfg. Co., C. J.

Lacing—Belt.
(See Belt Lacing).

Lamps—Incandescent and Arc.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Jones Mchry. Corp.
Walraven Co.
Westinghouse Lamp Co.

Lamp Guards—Key Locking.
Flexible Steel Lacing Co.

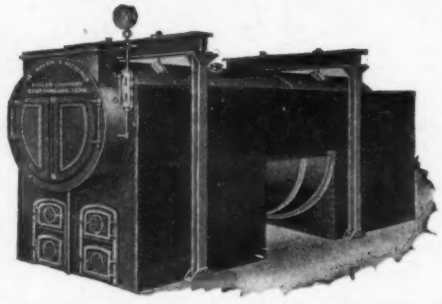
Lamp Reflectors.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Crouse-Hinds Co.
Cutter Co., George.

Landscape Architects.
(See Village Architects).

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latch Needles.
Paulus, Chas. B.

WALSH & WEIDNER BOILERS



Set in Our Improved Steel Casings

SAVE 10% TO 25% OF YOUR FUEL BILL

Send for Descriptive Bulletin

Boilers, Tanks, Boiler Tubes, Castings,
Structural Steel Work, Etc.

THE WALSH & WEIDNER BOILER CO.
CHATTANOOGA, TENN.

Wheels or Gears Come Off Quick and Clean

There will be no more back-breaking labor, no more damaged wheels or gears, when you take them off the shaft by means of the

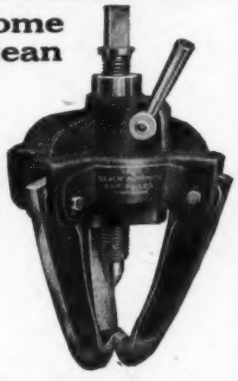
GREB AUTOMATIC GRIP PULLER
GREB PATENT

which is the best tool made for the purpose, and can be used for removing wheels, gears, commutators, transmissions, pulleys, etc.

Strong, simple and trouble-proof. Adjusts itself instantly and locks in any position. Capacity 1 to 18".

Sent on 10 days' trial, and if it doesn't prove indispensable, your money will be refunded. Write today for bulletin and prices.

THE GREB CO. 81 State St. Boston, Mass.



HOYT LEATHER BELTING

The Standard Since 1835.

EDW. R. LADEW CO. INC.
NEW YORK, N.Y. U.S.A.
428 Broadway

"Every day a good Day"

You CAN MANUFACTURE WEATHER

Humidification-Dehumidification
Ventilation-Purification-Drying

Carrier Engineering Corporation
39 Cortlandt Street-New York
Boston Buffalo Philadelphia Chicago

There's a *Tycos* or a *Taylor* temperature instrument for every purpose

Taylor Instrument Companies
ROCHESTER, N.Y.

D. D.

BUYING A PIG IN A POKE

The buying of advertising space used to be buying "a pig in a poke." The quantity and quality of circulation was shrouded in mystery and often the bag was tied against investigation.

That day has passed. The advertiser no longer depends on "mere claims." The Audit Bureau of Circulation has untied the strings to the sack and the circulation of the better class of publications is thrown open for the most searching scrutiny.

In buying space in COTTON you are not buying "a pig in a poke." Our A. B. C. statements will stand the analysis of the most exacting investigator.

The Jones Machinery Corporation Atlanta, Georgia.

Large stock of New and Used Apparatus of all kinds, for immediate shipment.

MOTORS, GENERATORS, COMPRESSORS, PUMPS, MACHINE TOOLS, WOOD-WORKING AND TEXTILE MACHINERY. BOILERS AND ENGINES.

Also a Well Equipped Repair Shop for all kinds of Electrical Repairs.

BUYERS' INDEX—Continued.

Laundry Machinery.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Lavatories.
Crane Co.
Vogel Co., Jos. A.

Lawn Mowers.
Ideal Lawn Mower Co.

Leather Belting.
(See Belting).

Leather Specialties.
American Supply Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Williams & Sons, I. B.

Lights—Flood.
Crouse-Hinds Co.

Linen Yarns.
(See Yarns—Linen).

Link Belting.
(See Belting—Link).

Linters.
(See Waste Dealers).

Liquid Chlorine.
(See Chlorine).

Loaders—Wagon and Truck.
Link-Belt Company.
Portable Machinery Co.

Locks and Latches.
Richards-Wilcox Mfg. Co.

Lockers—Metal.
Collins, J. D.
Dowman, George.
Medart Mfg. Co., Fred.

Logwood Extract.
(See Dyestuffs and Chemicals).

Looms.
Atlanta Textile Mchry. Co.
Augusta Mill Supply Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Jones Mchry. Corp.
Mason Machine Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield, Wm. & Co.
Slaughter Mchry. Co., G. G.
Stafford Co., The.
Upchurch, C. L.

Loom Attachments—Automatic.
Draper Corporation.
Hopedale Mfg. Co.

Loom Harness.
(See Harness).

Lubricants.
Dixon Crucible Co., Jos.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.

Lug Straps.
(See Straps—Lug).

Lumber.
Kirkpatrick Lumber & Timber Co.
Southern Cypress Mfg. Asso.
Tuxbury Lumber Co., A. C.

Lunch Room Equipment.
(See Restaurant).

Machine Tools.
(See Tools).

Machinists.
Cresson-Morris Co.

Marking—Dry Transfer.
Kaumagraph Co.

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Mercerized Yarns.
(See Yarn Manufacturers).

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Metal Ceilings, Etc.
Dowman, George.
Lupton's Sons Co., David.

Metals—Perforated.
(See Screens and Sieves).

Metal Workers—Sheet.
Dowman George.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric, Steam, Etc.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co.

Meters—Revolution.
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill).

Mill Engineer.
(See Architects and Engineers).

Mill Villages.
(See Villages).

Mill Supplies—Miscellaneous.
(See Supplies—Mill).

Mill White Paint.
(See Paint).

Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.

Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Bryan Electric Co.
Carter Electric Co.
Dixie Electrical Equipment Co.
General Electric Co.
Hulme, J. S.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.

Moving Picture Mch. & Supplies.
(See Theatre Equipment).

Nails—Cement Coated.
Lovingood Co.
Regnas Co., J. R.

Nappers.
Roy & Son Co., B. S.

Needles—Latch.
Paulus, Chas. B.

Oils.
Hampden Paint & Chem. Co.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Southern Cotton Oil Co.
Wadsworth, Howland & Co., Inc.

Oils—Finishing.
(See Finishing and Sizing Materials).

Oils—Lubricating.
(See Lubricants).

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oil Tanks and Pumps.
Wayne Oil Tank & Pump Co.

Oil Testing Instruments.
Tagliabue Mfg. Co., C. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste, Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Organs.
Stieff, Inc., Chas. M.

Oxidizing Machinery.
Cocker Mch. & Fdry. Co.
Rome Mch. & Fdry. Co.
Salem Iron Works.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Standard Gas Products Co.
Standard Welding & Machine Co.

Packing Boxes & Cases—Wooden.
Hightower Box & Tank Co.
Walke Box Co., Inc.
Wall & Son, C. M.

Packings.
Augusta Mill Supply Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Walraven Co.
U. S. Rubber Co.

Paint.
Barrett Co., The.
Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Gulf States Creosoting Co.
Hampden Paint & Chem. Co.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Southern Distributing Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Painting Contractors.
Marshall Co., H. Newton.

Panel Boards.
(See Switchboards).

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Perforated Metal.
(See Screens and Sieves).

Peroxides.
Roessler & Hasslacher Chemical Co.

Pianos and Players.
Stieff, Chas. M.

Pickers—Curled Hair.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Leather.
Augusta Mill Supply Co.
Garland Mfg. Co.

Picker Sticks.
Augusta Mill Supply Co.
Garland Mfg. Co.
Southern Bending Co.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.
General Electric Co.

Pipe and Pipe Fittings.
Crane Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

Pipe Threading and Cutting Machines.
Seeger Machine Tool Co.
Walraven Co., The.

Playground Apparatus Equipment.
Crane Co.
Ideal Lawn Mower Co.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Puro Sanitary Drinking Fountain Co.

Pneumatic Machinery & Tools.
Curtis Pneumatic Mchry. Co.

Pool Tables, Etc.
Brunswick-Balke-Collender Co.

Portable Conveyors.
(See Conveyor.)

Power Transmission.
Aldrich Mach. Works.
Allis-Chalmers Mfg. Co.
Augusta Mill Supply Co.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Chicago Pulley & Shafting Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
General Electric Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Jewell Belting Co.
Jones Mchry. Corp.
Ladew & Co., Inc., Edw. R.
Link-Belt Company.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Seeger Machine Tool Co.
Slaughter Mchry. Co., G. G.
Standard Pressed Steel Co.
U. S. Ball Bearing Co.
U. S. Rubber Co.
Valley Iron Works.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

Presses.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Galland-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Pulleys.
Augusta Mill Supply Co.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Valley Iron Works.
Walraven Co., The.

Pulley Covering.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Hughes Specialty Well Drilling Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Toomey, Frank.
Walraven Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

Pump Valves.
(See Valve Discs).

Psychrometers—Sling.
Taylor Instrument Co.

Pyrometers.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Machine Co.
Dufur & Co.

Railroads.
Southern Railway Systems.

Receptacles—Fibre.
(See Fibre Products).

Recording Instruments.
General Electric Co.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Recorders—Draft.
Tagliabue Mfg. Co., C. J.

Recorders—Pressure.
Tagliabue Mfg. Co., C. J.

Recorders—Temperature.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Southern Bending Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

Reflectors—Lamp.
(See Lamp Reflectors).

Regulators—Condensate.
Tagliabue Mfg. Co., C. J.

Regulators—Liquid Level.
General Electric Co.
Tagliabue Mfg. Co., C. J.

Refrigerating Machines.
Southern States Supply Co.

Regulators—Pressure.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers).

Regulators—Time.
Tagliabue Mfg. Co., C. J.

Reinforcing Slag.
Birmingham Slag Co.

Reinforcement Bars for Concrete.
Corrugated Bar Co.

Repairing—Electrical.
Jones Mchry. Corp.
Westinghouse Elec. & Mfg. Co.

Repairing—Textile Machinery, Etc.
Autogenous Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

Restaurant Equipment.
Chattanooga Queensware Co.
Reischmann Co.
Pick & Co., Albert.
Sani Products Co.
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings).

Rivets—Belt.
Crescent Belt Fastener Co.

Rocker Shaft Bearings.
(See Bearings).

Rolls—Calender.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son, B. F.
Roy & Son Co., B. S.
Textile Finishing Machinery Co.

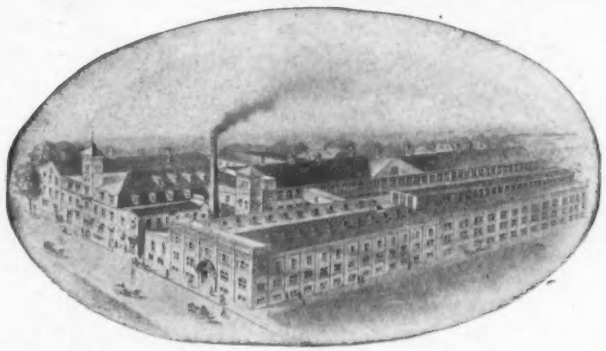
Rolls—Rubber Covered.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son Co., B. F.
Textile Finishing Machinery Co.

Emmons Loom Harness Company

LAWRENCE, MASS.

THE LARGEST MANUFACTURERS OF LOOM HARNESS AND REEDS IN AMERICA

Loom Harness and Reeds



COTTON HARNESS for all kinds of Plain and Fancy Weaves in Cotton and Silk Goods.

MAIL HARNESS for Cotton Duck, Worsted, Silk and Woolen Goods.

SELVEDGE HARNESS, any depth up to 25 inches, for Weaving Tape Selvedges.

REEDS for Cotton, Woolen, Silk and Duck.

Slasher and Striking Combs, Warper and Leice Reeds, Beamer and Dresser Hecks, Mending Eyes, Jacquard Heddles.

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres. Telephone Ivy 869
H. M. RICE, C. P. A., Vice-Pres. Cable Address
A. F. LAFRENTZ, Secy. & Treas. Amdit, New York

NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., Waldorf-Astoria.
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Bellevue Court Bldg.
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Building.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
LONDON, E. C.—50 Gresham St., Bank.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.

Specialists in Cost Systems and Manufacturing Accounts.

C. B. BIDWELL, P. A., Resident Vice-President

Shafts, Pulleys, Hangers, Belting Packing Lacing, **BOILERS** For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA.

PERFORATED METALS

of Aluminum, Brass, Copper, Steel, Tin, Zinc and other Sheet Metals and materials for Cotton Seed Oil Mills, Cotton Gins, Phosphate Screens, Coal Screens, Ventilators, Electrical Devices, Sugar Mills, Surfacing for Sand Rolls, Threshing Machines, Fanning Mills, Pulp Machinery, Grilles (Register Faces) all Mining Screens and

FOR EVERY PURPOSE

The Best screens possible. We make everything in perforated metals. All orders handled rush.
Send for Metal Sample Plate Circular.

ERDLE PERFORATING CO.
163 York St. Rochester, N. Y.

Spiker & Lose

ENGINEERS

Reports, estimates, appraisals, plans, supervision and consultation on all classes of reinforced concrete, steel and timber structures. Specialty — mills, warehouses, industrial and hydro-electric developments.

519-20 Forsyth Bldg., Atlanta, Ga.

BUYERS' INDEX—Continued.

Rolls—Steel.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son, B. F.
Southern Spindle & Flyer Co.
Textile Finishing Machinery Co.

Rolls—Top.
Campbell Mfg. Co.

Roofing.
Barrett Co., The.
Cooledge & Sons, F. J.
Cortright Metal Roofing Co.
Dowman, George.
Kirkpatrick Lum. & Timber Co.
Peaslee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.

Roof and Cement Coating.
Barrett Co.
Cooledge & Sons Co., F. J.
Du Pont de Nemours & Co., E. I.
Hampden Paint & Chem. Co.
Johnson & Co. Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint Co.
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Walraven Co.

Roving Cans and Trucks.
(See Cans—Roving).

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc).

Rubber Goods.
U. S. Rubber Co.

Sanitary Products.
Chattanooga Queensware Co.
Crane Co.
Dail Steel Products Co.
Hackney Bros. Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Sani Products Co.
United Electric Co.
Vogel Co., Jos. A.

Sash-Window—Steel.
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.

Scales.
American Kron Scale Co.
Lovingood Co.
Torsion Balance Co.

Scale Preventer—Boiler.
(See Boiler Feed Water Purification).

Screens and Sieves—Perforated.
Erdle Perforating Co.
Link-Belt Company.

Scouring Machinery.
(See Washers (Cloth)

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Second Hand Machinery and Supplies.
Atlanta Textile Mchry. Co.
Jones Mchry. Corp.
Toomey, Frank, Inc.
Upchurch, C. L.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The.
Textile Finishing Machinery Co.
Willcox & Gibbs Sewing Machine Co.

Shades—Electric Lamp.
(See Reflectors).

Shafting and Hangers.
Augusta Mill Supply Co.
Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.,
Fafnir Bearing Co.
Link-Belt Co.
Seeger Machine Tool Co.
S K F Industries.
Standard Pressed Steel Co.
Valley Iron Works.
Walraven Co., The.

Shears.
Roy & Sons Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Dowman, George.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Medart Mfg. Co., Fred.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.
Dowman, George.

Shingles—Wood.
Kirkpatrick Lum. & Timber Co.
Southern Cypress Mfg. Asso.

Shipping Room Machinery and Supplies.
American Kron Scale Co.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Collins, J. D.
Diamond State Fibre Co.
Elwell-Parker Electric Co.
Handy Equip. Corp.
Hightower Box & Tank Co.
Hulme, J. S.
Keystone Fibre Co.
Lane & Bro., W. T.
Lovingood Co.
McKinney Mfg. Co.
Regnas & Co., J. R.
Rogers Fibre Co.
Standard Fibre Co.
Seeger Machine Tool Co.
Signode System, Inc.
Torsion Balance Co.
Walraven Co., The.
Walke Box Co., Inc.
Wall & Son, C. M.

Shower Baths and Cabinets.
Crane Co.
Shower Bath Cabinet Co.

Shuttles.
Crompton & Knowles Loom Wks.
Honedale Mfg. Co.
Draper Corporation.
Shambow Shuttle Co.
Southern Bending Co.

Sinkers.
Paulus, Chas. B.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Size Kettles.
Butterworth & Sons Co., H. W.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

Sizing and Finishing Compounds.
(See Finishing and Sizing Materials).

Skewers.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Steel.
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.

Slag for Concrete.
Birmingham Slag Co.

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
Massberg Co., Frank.
Regnas & Co., J. R.
Saco-Lowell Shops.
Salem Iron Wks.
Textile Finishing Machinery Co., The.

Slasher Tape.
(See Tape—Slasher).

Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Richards-Wilcox Mfg. Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arnold, Hoffman Co.
Borne, Scrymser Co.
Dobbins Soap Mfg. Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Klipstein & Co., A.
Newport Chemical Works.
Pick & Co., Albert.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques.

Soda Ash.
Klipstein & Co., A.

Softeners—Cotton.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Schrymser Co.
Bosson & Lane.
Du Pont de Nemours & Co., E. I.
Grasselli Chemical Co.
Kali Mfg. Co.
Klipstein & Co., A.
Moore Oil Refining Co.
Newport Chemical Works.
Pick & Co., Albert.
Roessler & Hasslacher Chemical Co.
Sonneborn Sons, Inc., L.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Softeners—Water.
(See Water Softeners).

Solderless Connectors—Frankel.
Westinghouse Elec. & Mfg. Co.

Solvents.
(See Finishing).

Sorting Table Tops.
Pick & Co., Albert.
Reischmann Co.
Sani Products Co.

Spindles.
Allen Spindle Corp.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Spindles—Ball Bearing.
Allen Spindle Corp.

Spinners.
Smookes Mfg. Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks.
Honedale Mfg. Co.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co.
Gosist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Spinning Tape Specialists.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Campbell Mfg. Co.
Knit Goods Specialty Co.

Spooling Machinery.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Spools and Skewers.
Greenville Spool & Mfg. Co.

Sprinkler Tanks.
(See Tanks, Towers, Etc.).

Sprockets.
Link-Belt Company.
Morse Chain Co.
Valley Iron Works.

Stamping—Die Transfer System.
Kaumagraph Co.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.
Southern Stamp & Stencil Co.

Stand Pipes.
(See Tanks, Towers, Etc.).

Starch and Gums.
(See Finishing and Sizing Materials).

Steam Engines.
(See Engines—Steam).

Steam Hose.
(Ste Hose—Steam).

Steam Pumps.
(See Pumps—Steam).

Steam Traps.
(See Traps—Steam).

Steel Buildings.
Dowman, George.

Steel Doors, Window, Partition, Etc.).
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.

Steel Lockers.
Medart Mfg. Co., Fred.

Stencils and Stencil Papers.
(See Stamps and Stencils).

Stencil Brushes.
(See Marking Pots and Brushes).

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.
Southern Stamp & Stencil Wks.

Sticks (Picker).
See Picker Sticks.

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Honedale Mfg. Co.
Whitin Mch. Wks.
Wildman Mfg. Co.

Stokers.
Cokal Stoker Co.
Westinghouse Elec. & Mfg. Co.

Storage Batteries.
Edison Storage Battery Co.

Storage Racks.
(See Shelving).

Straps—Lug.
Augusta Mill Supply Co.
Garland Mfg. Co.

Strapping.
(See Leather Specialties or Band Strapping).

Street Lighting Fixtures.
Cutter Works, George.

Supplies—General Mill.
Augusta Mill Supply Co.
Hulme, J. S.
Jones Mchry. Corp.
Regnas & Co., J. R.
Seeger Machine Tool Co.
Slaughter Machinery Co., G. G.
Southern Distributing Co.
Steel Heddle Mfg. Co.
Upchurch, C. L.
Walraven Co., The.

Switches—Knife-Elec.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.

Switchboards—Panel.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tables, Chairs, Etc.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Pick & Co., Albert.
Reischmann Co.
Sani Products Co.
Wright Co.

Tachometers.
Tagliabue Mfg. Co.

Tag Addressing Machines.
Regnas & Co., J. R.

Tallow.
(See Finishing Materials).

Tanks and Tubs.
Hightower Box & Tank Co.
Lombard Iron Works & Supply Co.
Permutit Co.
Phila. Drying Machinery Co.
Salem Iron Wks.

Textile Machinery Engineers Always Specify BARBER Spinning Tapes

When tape drive was first applied to cotton frames practically all textile machinery engineers sought our aid in designing the proper weight and construction of tape to get maximum spindle speed and maximum service.

More than 90% of new tape drive cotton frames put out in the past five years have been started with BARBER spinning tapes.

We are spinning tape specialists, and BARBER Spinning and Twisting Tapes are acknowledged best the world over. They combine the utmost in quality materials, quality workmanship, and durability. We have a long established reputation for integrity and our styles set the standard.

We carry extensive stocks of spinning and twisting tapes for all kinds of textile machinery. A wire to us at our expense will bring you service that is swift and sure.

Wire us today or write for details.

BARBER MANUFACTURING COMPANY

Spinning Tape Specialists.

LOWELL, MASS.

ALL STEEL **ECONOMY** FIRE PROOF **BALING PRESSES**

ALL SIZES FOR ALL PURPOSES

LARGEST LINE BUILT IN U.S.A.

ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

A New Handbook

On Reinforced Concrete Construction

FOR engineers, architects, contractors and students of reinforced concrete construction, we offer a handbook, "USEFUL DATA ON REINFORCED CONCRETE BUILDINGS." Price $2.50.

CORRUGATED BAR COMPANY, Inc.

Mutual Life Building Buffalo, N. Y.

KIRKPATRICK

LUMBER & TIMBER CO.

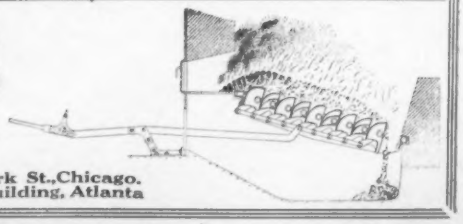
BIRMINGHAM, ALA.

WHOLESALE YELLOW PINE

Flooring, Ceiling, Siding, Timbers, Car Materials, Crating, Sheathing, Roofers, Lath

WE SOLICIT YOUR INQUIRIES AND ORDERS

COKAL HAND STOKERS



Hundreds of satisfied users report saving of fuel and increased boiler capacity.

Write for Catalog.

COKAL STOKER CORPORATION, 1017 N. Clark St., Chicago. 517 Hurt Building, Atlanta

BUYERS' INDEX—Continued.

Textile Finishing Machinery Co., The.
Walsh & Weidner Boiler Co.

Tapes and Braids.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Knit Goods Specialty Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tape—Slasher.
Lovingood Co.
Regnas & Co., J. R.

Tapes—Spinning and Twisting.
Barber Mfg. Co.
Knit Goods Specialty Co.

Tape Making Machines.
(See Bandage and Tape Mach.)

Telephones—Calling System.
Carter Electric Co.
Dixie Elec. Equip. Co.

Temperature Controllers.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Temples.
Draper Corporation.

Tenters.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

Tenter Frame Guider (Electric).
Blake Elec. Co.

Textile Machinery.
(See Cotton Mill Machinery).

Theatre Equipment.
Lucas Theatre Supply Co.
Southern Theatre Equip. Co.

Thermometers—All Kinds.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Mitchell-Bissell Co.
Palmer Co., The I. E.

Tiering Machines.
Collins, J. D.
Lovingood Co.
Portable Mchry. Co.
Regnas & Co., J. R.

Ties—Baling.
(See Bale Ties).

Tires—Auto and Truck.
U. S. Rubber Co.

Toilets.
Crane Co.
Dail Steel Products Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Tools—All Kinds.
Jones Mchry. Corp.
National Machine Tool Co.
Seeger Machine Tool Co.
Walraven Co., The.

Towers.
(See Tanks and Towers).

Tractors—Electric, Industrial.
Collins, J. D.
Elwell-Parker Elec. Co.
Regnas & Co., J. R.

Transmission—Power.
(See Power Transmission Machinery).

Transfer Points.
Paulus, Chas. B.

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co.

Trucks—Auto.
Packard Motor Car Co.
White Co., The.
White Hickory Motor Corp.

Truck & Wagon Loaders.
Portable Mchry. Co.

Trucks, Baskets, Etc., Canvas.
Lane & Bro., W. T.

Trucks—Electric—Inter.
Collins, J. D.
Elwell-Parker Electric Co.
Regnas & Co., J. R.

Trucks—Hand and Elevating.
Collins, J. D.
Elwell-Parker Elec. Co.
Handy Equip. Corp.
Hulme, J. S.
Lovingood Co.
McKinney Mfg. Co.
Regnas & Co., J. R.

Trucks—One Man.
Handy Equip. Corp.
McKinney Mfg. Co.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Tubes—Cloth.
Diamond State Fibre Co.

Turbines—Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Twisting Machinery and Supplies.
Barber Mfg. Co.
Draper Corporation.
Howard & Bullough.
Knit Goods Specialty Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Unloader & Bag Pilers.
Portable Mchry. Co.

Urinals.
Crane Co.
Dail Steel Products Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Unions—Bronze.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Vacuum Cleaning System for Mills.
United Electric Co.

Vacuum Pans.
Cresson-Morris Co.

Valves—Angle, Globe, Cross, Blow-off, Check, Gate, Pop-Safety, etc.).
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Non-return Stop.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valve Discs.
Graton & Knight Mfg. Co.
Jenkins Bros.

Varnishes.
Barrett Co.
Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Hampden Paint & Chem. Co.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Ventilating Apparatus.
American Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Perkins & Son, Inc., B. F.
Sargent's Sons Co., C. G.
Sturtevant Co., B. F.
Tolhurst Machine Co.

Vises and Benches.
Richards-Wilcox Mfg. Co.

Village Architects and Designers
Draper, E. S.
Lockwood, Green & Co.
Sirrine, J. E.
Spiker & Lose.
Tuxbury Lumber Co., A. C.

Village Houses.
(See Houses—Ready-Built).

Wagon and Car Unloaders.
Curtis Pneumatic Mchry. Co.
Portable Machinery Co.

Warehouse—Portable.
(See Buildings).

Warehouse—Storage.
Burg Line Agency.

Warehouse Door Hardware.
(See Doors and Hardware).

Warp Compressing Machinery.
Warp Compressing Mch. Co.

Warp Drawing Machine.
Cocker Machine & Fdry. Co.
Crompton & Knowles Loom Wks.

Warpers and Warping Machinery.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Howard & Bullough.
Mossberg Co., Frank.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Warp Compressing Mch. Co.

Washers—Cloth.
American Laundry Machinery Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.
Warp Compressing Mch. Co.

Washers.
Diamond State Fibre Co.
Graton & Knight Mfg. Co.

Waste Dealers.
Valley Waste Mills.

Waste Machinery—Cotton.
Howard & Bullough.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Watchman Clocks.
(See Clocks—Watchman).

Water Coolers—Fountain).
Crane Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.

Water Columns.
Lunkenheimer Co.

Water Softeners.
American Water Softener Co.
Borromite Co. of America.
Hulme, J. S.
Permutit Co.
Refinite Co.
Scaife & Sons Co., Wm. B.

Water Towers.
(See Tanks and Towers).

Waterproofing Machinery.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

Weaving.
(See Yarn Manufacturers).

Welding Apparatus—Electric Arc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Welding Apparatus and Supplies—Oxy-Acetylene.
Commercial Acetylene Supply Co.
Southern Welding Co.
Standard Gas Products Co.

Welding—Job.
Autogenous Welding Co.
Southern Welding & Mach. Co.
Standard Gas Products Co.

Welfare Architects.
(See Village Architects).

Welfare Equipment.
Chattanooga Queensware Co.
Crane Co.
Cutter Works, George.
Hill Standard Co.
Ideal Lawn Mower Co.
Medart Mfg. Co., Fred.
Pick & Co., Albert.
Puro Sanitary Drinking Fountain Co.
Reischmann Co.
Sanitas Co.
Sani Products Co.
Southern Theatre Equip. Co.
Stieff, Inc., Chas. M.
Thomas Co., F. H.
Wright Co.

Well Drilling.
Hughes Specialty Well Drilling Co.
Robbins, J. E.

Wheels—Fibre.
(See Fibre Products).

Wheel Puller.
General Electric Co.
Greb Co., Inc.

Whistles—Steam.
Crane Co.
Lunkenheimer Co.

Whizzers.
Tolhurst Mch. Wks.

Winders.
Firsching, J. A.
Howard & Bullough, American Machine Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Stafford Co., The.
Universal Winding Co.

Windows—Steel.
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.

Wires—Drop.
(See Drop Wires).

Wiring Conduit & Fittings.
See Electric Conduits.

Wiring—Elecrical.
(See Electrical Contractors).

Wood.
(See Lumber).

Wood Preserver.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Gulf States Creosoting Co.
Johnson & Co., Inc., Oliver.
Patterson Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Wood Pulleys.
(See Pulleys).

Woodworkers' Benches and Vises.
Richards-Wilcox Mfg. Co.

Woolen Machinery.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Wks.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Stafford Co., The.
Textile Finishing Machinery Co.
Whitin Machine Works.

Wrenches.
Lane Unique Tool Co., Wm. B.

Yarn Manufacturers.
American Processing Co.
Amoskeag Mfg. Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Weimar Bros.

Yarn Dealers & Comm. Merchants.
(See Cotton Yarn and Cloth Commission Merchants and Dealers).

Yarn Dyers.
(See Dyers).

Yarn Testers.
Scott & Co., Henry L.

UNIVERSAL WINDING COMPANY
TEXTILE WINDING MACHINES
LEESONA

An Atlanta Office
in charge of
Winthrop S. Warren
has been opened at
1121 Candler Building

Frederick Jackson,
SOUTHERN AGENT,
Box 523, Charlotte, N. C.

BOSTON, U.S.A.
PROVIDENCE, R.I. NEW YORK CHARLOTTE, N.C.
PARIS MANCHESTER BOMBAY

COAL

HIGH GRADE
KENTUCKY, TENNESSEE AND ALABAMA
STEAM, GAS,
DOMESTIC, SMITHING
FURNACE AND FOUNDRY COKE
UNITED STATES FUEL CORPORATION
CHATTANOOGA, TENN.

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY,
Iron Founders, Textile Machinery Builders.
Krams Ave., Manayunk, Philadelphia, Pa.

"Load and Look"
Kron Scales
AUTOMATIC Made in U. S. A. SPRINGLESS
All Metal Construction
There's a Kron for Every Weighing Purpose
ALL TYPES. ANY CAPACITY. *Dormant or Portable—Hanging Pan Types—Overhead Track—Suspension Crane, etc.*
Write for a copy of our catalogue.
AMERICAN KRON SCALE CO.
430 East 53rd St., New York
Branch Offices and Service Stations in Principal Cities
CANADIAN KRON SCALE CO., MONTREAL, CANADA.

B C
TRADE MARK
BARBER-COLMAN COMPANY
Main Office and Factory
Rockford, Ill.
Boston, Mass. Greenville, S. C.
WARP TYING MACHINES
WARP DRAWING MACHINES
HAND KNOTTERS FOR SPOOLING AND WINDING

STENCILS FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS
RUBBER STAMPS, NOTARIAL AND CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 33 LUCKIE ST. WORKS 350 EDGEWOOD AVE.
P.O. BOX 834 OLDEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA, GA.

WAREHOUSE COMPANY "MAASVEEM"
Incorporated
Offices 5-7 Calandstraat
ROTTERDAM, HOLLAND
Warehouses for Cotton
Modern Equipment
Advances on our warehouse certificates are obtainable.
Bankers:—Rotterdamsche Bankvereeniging
At Rotterdam, Amsterdam and
The Hague
For Particulars Apply to
BURG LINE AGENCY
SAVANNAH, GA.

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.

Advertisers' Index

Aberthaw Construction Co. ... 61
Aldrich Machine Works 363
Allen Spindle Corp. 186
Allis-Chalmers Mfg. Co. 368
Althouse Chemical Co. 347
American Audit Co. ..381 and 391
American Blower Co. 54
American Cast Iron Pipe Co...371
American City Engineering Co.224
American Kron Scale Co. 395
American Laundry Mchry. Co.330
American Machine Co., H. & B.183
American Processing Co. 348
American Scrubbing Equipment Co. 37
American Supply Co. 352
American Textile Banking Co., Inc. 246
American Water Softener Co. .332
Amoskeag Mfg. Co. 380
Anchor Post Iron Works 1
Aniline Dye & Chemicals, Inc..350
Arabol Mfg. Co. 342
Arkray Mills, Inc. 372
Arlington Cotton Mills 372
Arnold, Hoffman & Co. 346
Arrow Mills, Inc. 372
Atlanta Brush Co. 222
Atlanta National Bank 373
Atlantic Dyestuff Co. 360
Atlanta Rubber Stamp & Stencil Works 395
Atlanta Textile Mchry. Co.....382
Atlas Electric Devices Co. ... *
Augusta Mill Supply Co. 244
Autogenous Welding Co. 57

Barber-Colman Co. ....26 and 395
Barber Mfg. Co. 393
Barrell Co., Wm. L. 378
Barrett Co., The 179
Beer, H. & B. 380
Benjamin Electric Co. 70
Birmingham Slag Co. 360
Blake Electric Co. 20
Bliss, Fabyan & Co. 378
Borne, Scrymser Co. 338
Borromite Co. of America 337
Bosson & Lane 350
Bradley Mfg. Co., A. J. 244
Brinton Co., H. 242
Brunswick-Balke-Collender Co.. 35
Bryan Electric Co. 368
Burg Line Agency 395
Butterworth & Sons Co., H. W.331

Campbell Mfg. Co. ..... *
Carlisle & Gale Co. 362
Carlyle-Johnson Machine Co... 51
Carrier Engineering Corp. 389
Carter Electric Co. 370
Carver-Beaver Yarn Co. 244
Chattanooga Queensware Co...355
Chicago Pulley & Shafting Co. *
Chicago Watchman's Clocks Works 224
Citizens & Southern Bank 374
Classified Opportunities 382
Cocker Machine & Foundry Co.334
Cokal Stoker Co. 393
Collins, J. D. 359
Commercial Acetylene Supply Co. 222
Consolidated Color & Chem. Co.341
Converse & Co. 78
Cooledge & Sons, F. J. 363
Cooper Hewitt Electric Co. ... 75
Corn Products Refining Co. ...349
Corrugated Bar Co., Inc. 393
Cortright Metal Roofing Co...329
Crane Co. .....
Crescent Belt Fastener Co. ... *
Cresson-Morris Co. 364
Crompton & Knowles Loom Works 28
Crouse-Hinds Co. 71
Curtis Pneumatic Mchry. Co...212
Cutter Works, George 72
Cutts Co., E. A. 371
Cyclone Fence Co. 399

Dail Steel Products Co. ..... *
Davis, Roger W. 14
Detroit Steel Products Co. ... 69
Diamond State Fibre Co. 351
Dixie Electric Equipment Co...368
Dixon Crucible Co., Joseph ...226
Dobbins Soap Mfg. Co. 246
Dodge Sales & Eng'g Co. ... 47
Dowman, George 397
Draper Corporation 3
Draper, E. S. 244
Dufur & Co. 371
Du Pont de Nemours & Co., E. I. 339

Eco Clock Co. 354
Economy Baler Co. 393
Economy Fuse & Mfg. Co. 369
Edison Storage Battery Co. ... *
Electric Smelting & Aluminum Co. 246
Electro Bleaching Gas Co. ...329
Elwell-Parker Electric Co. ... *
Emmons Loom Harness Co. ...391
Erdle Perforating Co. 391
Ernst & Ernst 206

Fafnir Bearing Co. 218
Fawcett, Hughes 380
Ferguson Co., John W. 67
Firsching Co., J. A. 246
Flexible Steel Lacing Co. 49
Fletcher Works 336
Flint Mfg. Co. 372
Florsheim, H. A. 372
Fonda Organization, The E. A.. 13
Foundation Co., The 228

Gallard-Henning Mfg. Co. 359
Garland Mfg. Co. 226
General Electric Co. ..... *
General Machine Works 246
Goode, R. L. 371
Grasselli Chemical Co. 346
Graton & Knight Mfg. Co. ...400
Gray Mfg. Co. 372
Greb Co. 389
Gregory & Gregory, Walter ...244
Greenville Spool Mfg. Co. ...354
Greist Mfg. Co. 19
Gude & Co. 371
Gulf States Creosoting Co. ...360

Hackney Bros. 371
Hampden Paint & Chem. Co...361
Handy Equipment Co. ..... *
Hemphill Mfg. Co. 236
Hightower Box & Tank Co. 38
Hill Standard Co. 32
Hopedale Mfg. Co. 22
Hotel Sinton 385
Howard & Bullough Mach. Co..183
Hughes Specialty Well Drilling Co. 371
Hulme, J. S. 224
Hunter Mfg. & Comm. Co. ...375
Huntington & Guerry, Inc. ... 74
Hyatt Roller Bearing Co. .....4, 5, 8 & 9

Ideal Lawn Mower Co. 355
International Eng'g Works ... 58
Irving National Bank 209
Iselin & Co., Wm. 244

Jenkins Bros. 367
Jewell Belting Co. 365
Jones Machinery Corp. 389
Johnson & Co., Inc., Oliver ... 68
Jordan Mfg. Co. 224

Kali Mfg. Co. 345
Kaumagraph Co. 226
Keever Starch Co. 344
Keystone Fibre Co. 23
King, Jr., Habersham 244
Kirkpatrick Lumber & Timber Co. 393
Klauder-Weldon Dyeing Mach. Co. 337
Klipstein & Co., A. 338
Knit Goods Specialty Co. 216

Ludew Co., Edw. R. 389
Lane & Co., J. H. 376
Lane & Bro., W. T. 30
Lane Unique Tool Co., Will B.366
Lewis, John D. 244
Link-Belt Co. 48
Lockwood, Greene & Co. 361
Lombard Iron Works 391
Lovingood Co., The 224
Lowell Crayon Co. 329
Lunkenheimer Co. 15
Lupton's Sons Co., David 63

Marshall Co., H. Newton 363
Mason Machine Works 18
McKinney Mfg. Co. 40
Medart Mfg. Co., Fred 397
Merrow Machine Co. 240
Metz Co., H. A. .....340 and 341
Millers Indemnity Underwriters 214
Mitchell-Bissell Co. 2
Monroe Calculating Mch. Co... 31
Moore Oil & Refining Co. .... *
Morehead Mfg. Co. 56
Morse Chain Co. .....44 and 45
Mossberg Co., Frank ..... *
Myrtle Mills, Inc. 372

National Aniline & Chemical Co. 76
National Asso. Hosiery & Underwear Mfgrs. 240
National Bank of Commerce In New York 374
National Machine Tool Co. ...363
National Metal Molding Co. ...369
National Shawmut Bank ..... *
New York & N. J. Lub. Co....365
Newport Chemical Co. 210

Packard Motor Car Co. 41
Palmer Co., E. I. 351
Parks-Cramer Co. 24
Patterson Sargent Co. 65
Paulus, Chas. B. 242
Parkdale Mills, Inc. 372
Pearson, Jos. T. 246
Peaslee-Gaulbert Co. ..... *
Perkins & Son, Inc., B. F. ... 25
Permutit Co. 335
Phila. Textile Mchry. Co. ...337
Phila. Drying Mchry. Co. 336
Pick & Co., Albert .....
Portable Machinery Co. 55
Powers Regulator Co. 334
Precision Machine Co. 354
Proctor & Schwartz, Inc. 337
Puro Sanitary Drinking Fountain Co. 357
Putnam-Hooker Co. 379

Refinite Co., The ..... *
Regnas, J. R. 356
Reichmann Co. 33
Reliance Machine Works 242
Richards-Wilcox Mfg. Co. 362
Robert & Co. ..... *
Robbins & Sons J. E. 371
Roessler & Hasslacher Chemical Co. 220
Rogers Fibre Co. 353
Rome Mch. & Fdry. Co. 329
Roy & Sons Co., B. S. 28
Rundle-Spence Mfg. Co. 356
Russell Mfg. Co. 210

Saco-Lowell Shops 14
Salem Iron Works 329
Sani-Products Co. 184
Sanitas Co. 387
Sargent's Sons Corp., C. G. 332
Scaife & Sons, Wm. B. 397
Schaum & Uhlinger 336
Schofield Sons Co., J. S. 366
Schofield Co., Wm. 395
Scott & Co., Henry L. 202
Scott & Williams 231
Seeger Machine Tool Co. ..... *
Shambow Shuttle Co. 226
Sherman Service, Inc. ....6 and 7
Sherwood Mfg. Co. 52
Shower Bath Cabinet Co. ..... *
Signode System, Inc. 358
Sirrine, J. E. 64
S K F Industries, Inc. 43
Smith & Furbush Machine Co.. 27
Slaughter Mchry. Co., G. G. ..397
Sonneborn Sons Inc., L. 397
Southern Bending Co. 30
Southern Brush & Broom Co...354
Southern Cotton Yarn Co. 372
Southern Cypress Mfg. Asso. .. 62
Southern Distributing Co. 351
Southern Railway System 381
Southern Spindle & Flyer Co...352
Southern Stamp & Stencil Co..371
Southern States Supply Co. ... *
Southern Theatre Equip. Co .. 36
Southern Welding & Mach. Co..371
Spiker & Lose 391
Stafford Co., The 12
Standard Conveyor Co. 39
Standard Fibre Co. 385
Standard Gas Products Co. ...364
Standard Pressed Steel Co. 50
Steel Heddle Mfg. Co. 352
Stieff, Inc., Chas. 356
Sturtevant Co., B. F. ...16 and 17
Sumpass Chemical Co. 348
Swan & Finch 218

Tagliabue Mfg. Co. 338
Taylor Instrument Co. 389
Terrell Machine Co. 216
Texas Co. 53
Textile Banking Co. 374
Textile Finishing Mchry. Co...398
Thomas Co., F. H. 34
Thompson & Binger, Inc. 359
Tolar & Hart 377
Tolhurst Machine Co. 333
Toomey, Frank, Inc. 282
Torsion Balance Co. 358
Tropical Paint & Oil Co. 66
Turner Co., J. Spencer 379
Tuxbury Lumber Co., A. C.... 60

United Chemical Products Co..387
United Electric Co. ..... *
Universal System, Inc. 382
Universal Winding Co. 395
Upchurch C. L. 383
U. S. Ball Bearing Co. 46
U. S. Fuel Corp. 395
U. S. Rubber Co. ..... *

Valley Iron Works 367
Valley Waste Mills ..... *
Vogel Co., Jos. A. 358

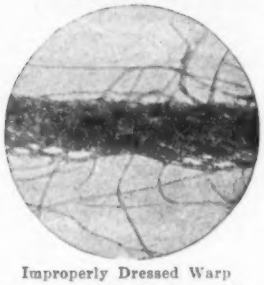
Wadsworth, Howland & Co., Inc. ..... *
Walke Box Co., Inc. 244
Wall & Son, C. M. 222
Walraven Co., The 366
Walsh & Weidner Boiler Co. ..389
Want Ads 382
Warp Compressing Machine Co. 29
Warren Soap Mfg. Co. 205
Weimar Bros. .....372 and 376
Westinghouse Electric & Mfg. Co. .....10 and 11
Westinghouse Lamp Co. 73
White Hickory Motor Truck Co. 357
Whitinsville Spinning Ring Co.353
White Co. ..... *
Whitin Machine Works 21
Whiton Machine Co., D. E. ...364
Wildman Mfg. Co. 232
Williams & Sons, I. B. 42
Wolf & Co., Jacques, ...348
Woodward, Baldwin & Co. ...377
Wright Co. ..... *

Zavon Co., Inc. 343

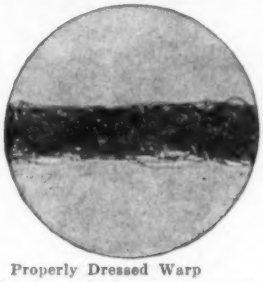
SONNEBORN PRODUCTS

Brighter Cleaner Softer Hosiery

For You If--



Improperly Dressed Warp



Properly Dressed Warp

You use the modern softening method and secure that even *dye penetration* which alone can produce the deep brilliant black, and the delicate lighter shades which the market always demands.

A very prominent Dyestuff Maker says:

"It is a pleasure to be able to say that the tests made in our New York Laboratory by your and our gentlemen show that your Clear Soluble 50% AMALIE SULPHO TEXTOL OIL seems to be a very satisfactory after-treating agent for materials dyed with our ATLANTIC BLACKS, from which we may deduce that it it a satisfactory article for after-treating materials dyed with the average sulphur black, and have no hesitancy in testifying to its good effects when properly used."

ATLANTIC DYESTUFF COMPANY
Chas. H. Stone, V-President.

AMALIE SULPHO TEXOL OIL

represents pure Castor, Grade A, Sulphonated by the exclusive Sonneborn Textile Laboratory process. It is *guaranteed more efficient; indispensable in rinsing bath*, and *greatly facilitates the boarding*. Trial barrel shipped on approval. Write for literature, testimonials and formula.

Textile Products Dixision **L. SONNEBORN SONS, Inc.** 262 Pearl St., New York

SONNEBORN

MEDART
Steel Lockers
Send for Catalog A-6
Playground & Gymnasium Equipment
Send for Catalog L
Fred Medart Manufacturing Co.
Potomac & DeKalb Sts. St. Louis, Mo.
Gordon Lewis, District Mgr., Walton Bldg., Atlanta, Ga.

GEORGE DOWMAN
200 NATIONAL CITY BUILDING,
ATLANTA, GEORGIA
We Are Prepared To Furnish
FIRE DOORS AND WINDOWS OF ALL TYPES
ORNAMENTAL IRON WORK
OVERHEAD CARRIER SYSTEMS
SKYLIGHTS, VENTILATORS
METAL SHINGLES AND CEILING
TOILET PARTITIONS—METAL STAIRS
Contracts Taken for Complete Installations

G. G. SLAUGHTER MACHINERY COMPANY
Textile Machinery and Power Plant Equipment
GREENVILLE, SOUTH CAROLINA

WATER
WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

THE TEXTILE-FINISHING MACHINERY CO

MAIN OFFICE AND WORKS
PROVIDENCE. R. I.

NEW YORK OFFICE
30 CHURCH ST.

Your Inquiries Solicited for

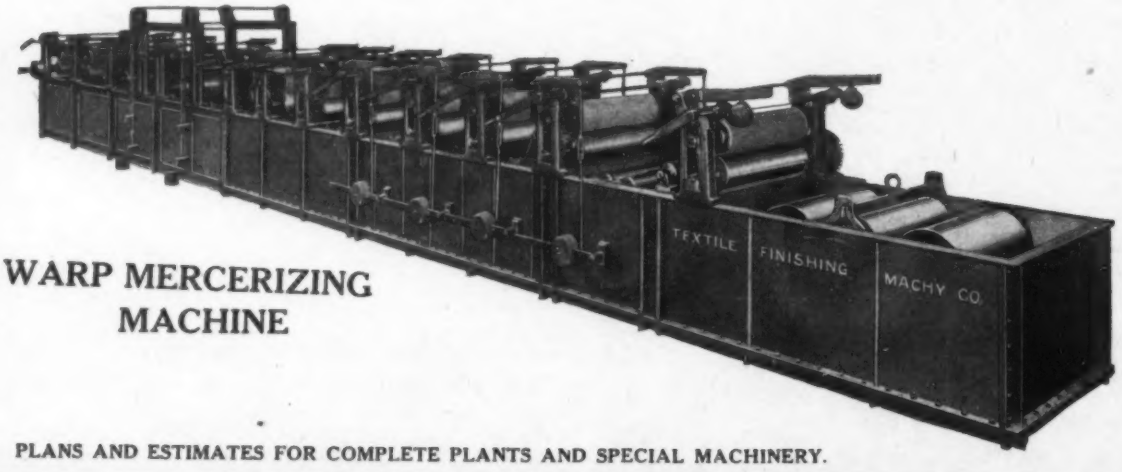
MACHINERY

of All Kinds and Types for Bleaching, Dyeing, Drying

Mercerizing and Finishing
Piece Goods and Warps

Our Specialties Are

Upright and Horizontal Dryers, Warp Mercerizing Machines, Singers, Kiers, Washers, Squeezers, Scutchers, Dye Jiggs, Mangles, Calenders, Tenters, Color and Size Kettles, Warp Dyeing Machinery, Elastic Web and Narrow fabric Finishing Machinery, and Calender Rolls for Cotton, Husk, Paper and Patent Combinati on.



WARP MERCERIZING MACHINE

PLANS AND ESTIMATES FOR COMPLETE PLANTS AND SPECIAL MACHINERY.

CYCLONE FENCE

A New Leaf for the New Year — and the Years to Come
1921
1920
Property Destruction and Loss
Look for the "Red Tag"
PROPERTY PROTECTION

"Off with the old, on with the new."

Turn over a new leaf — start the New Year with a resolve to make your property safe. Install Cyclone Fence — it means Property Protection every day throughout the years.

Cyclone Fence ends the day of outside dangers to industrial property — signalizes the dawn of a new day — an era of permanent property protection and freedom from property loss.

PHONE, WIRE OR WRITE MAIN OFFICES, WAUKEGAN, ILLINOIS OR BRANCH OFFICES NEAREST YOU

CYCLONE FENCE COMPANY · Waukegan, Illinois

Factories: WAUKEGAN, ILLINOIS; CLEVELAND, OHIO; FORT WORTH, TEXAS

BRANCHES:

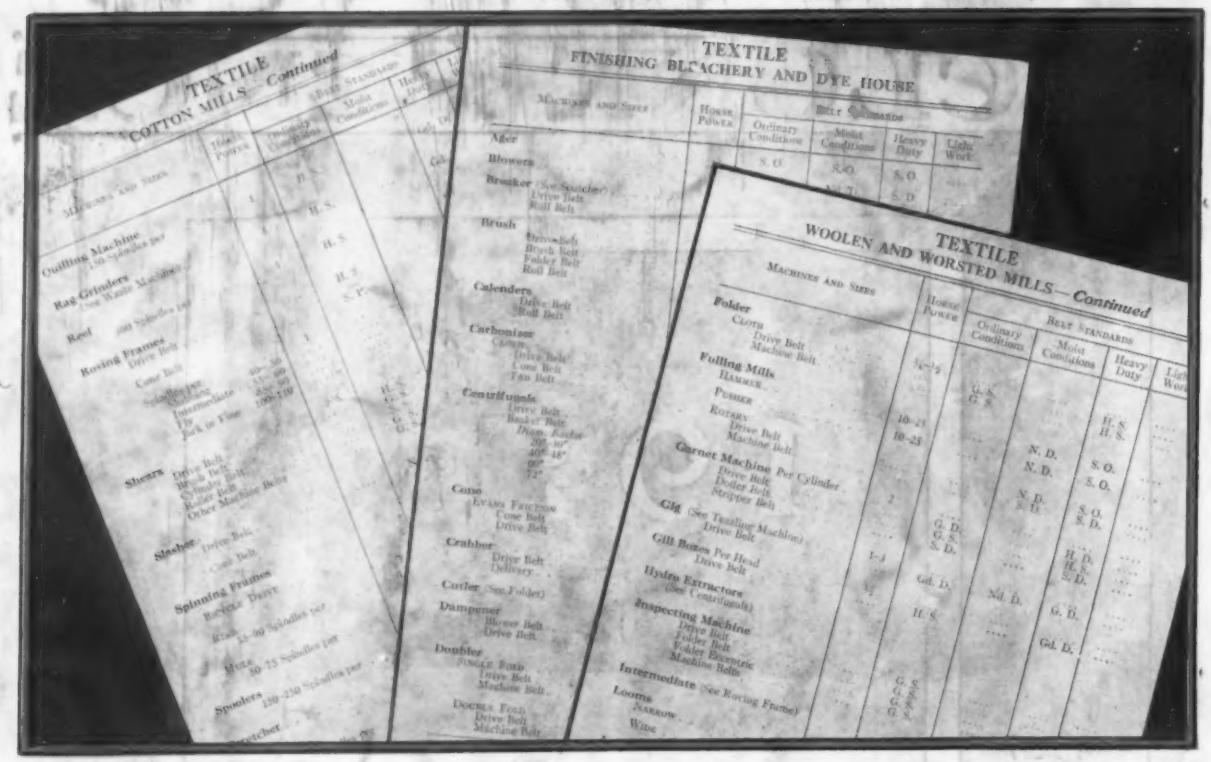
CHICAGO INDIANAPOLIS DETROIT
ROCHESTER PHILADELPHIA NEW YORK

BRANCHES:

BALTIMORE ST. LOUIS OAKLAND
PORTLAND SAN FRANCISCO LOS ANGELES

Let Us Know Your Requirements. No Obligation

Ask for Bulletin No. 28, Sent Free



Valuable information on textile mill belting — yours for the asking

How do you determine which is the correct belt for the bicycle drive in the cotton mill, the stripper drive in the woolen mill or the dye kettle in the finishing plant?

The wrong belt causes trouble, wastes power and cuts down production.

This useful book specifies the correct belt for every drive in the textile industry, and shows how you can determine the size and kind of belt needed for any drive in your plant.

It shows how to find the horsepower transmitted, the belt speed per minute, the correct tension, etc.

This information has been gathered by belting engineers who have gone into the textile mills and studied actual conditions, and have forever eliminated the "guess" from belting.

This handy book — No. 101K — will be gladly sent free on request.

This trademark is the symbol of the scientific control of tanning and manufacturing processes and the application of the correct belt for every drive in every industry.

The Graton & Knight Mfg. Co.

WORCESTER, MASS.

Oak Leather Tanners, Makers of Belts and Other Leather Products

Distributors and Branches in All Principal Cities

12

Graton & Knight

Standardized Series

Leather Belting

Tanned by us for belting use